

Edited at the
Massachusetts Institute of Technology
October / November, 1968. Price \$1

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Technology Review

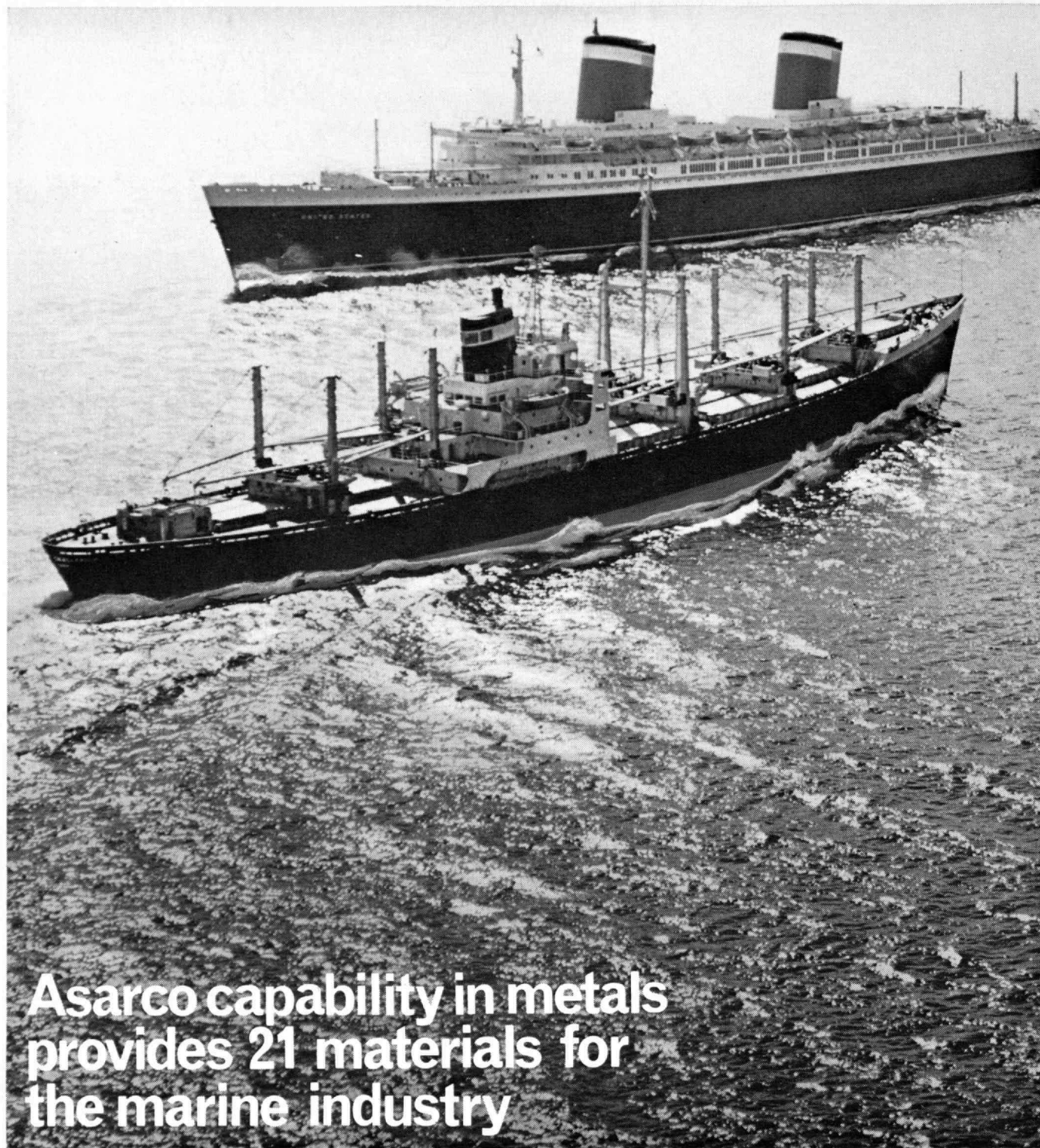


The Cultural Revolution:
New Prospects
for Chinese Science

technology review

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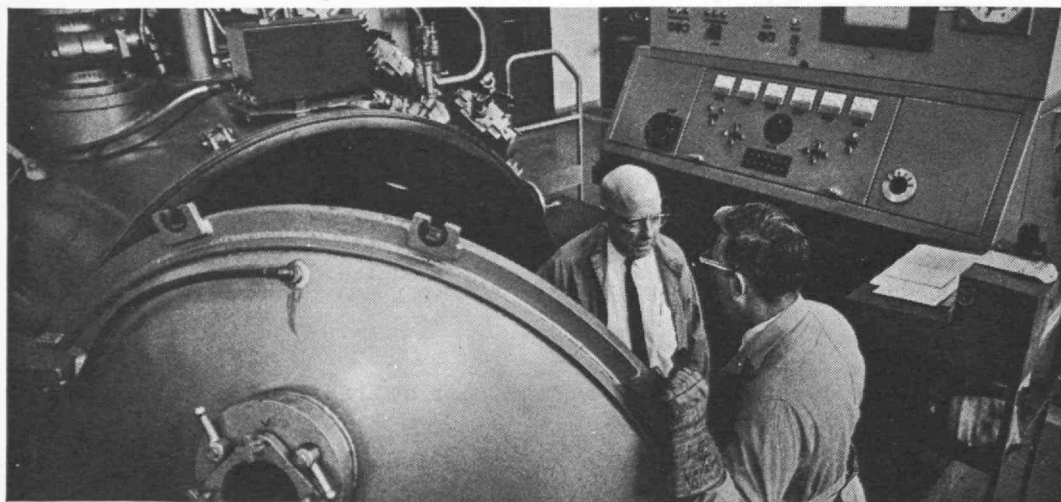
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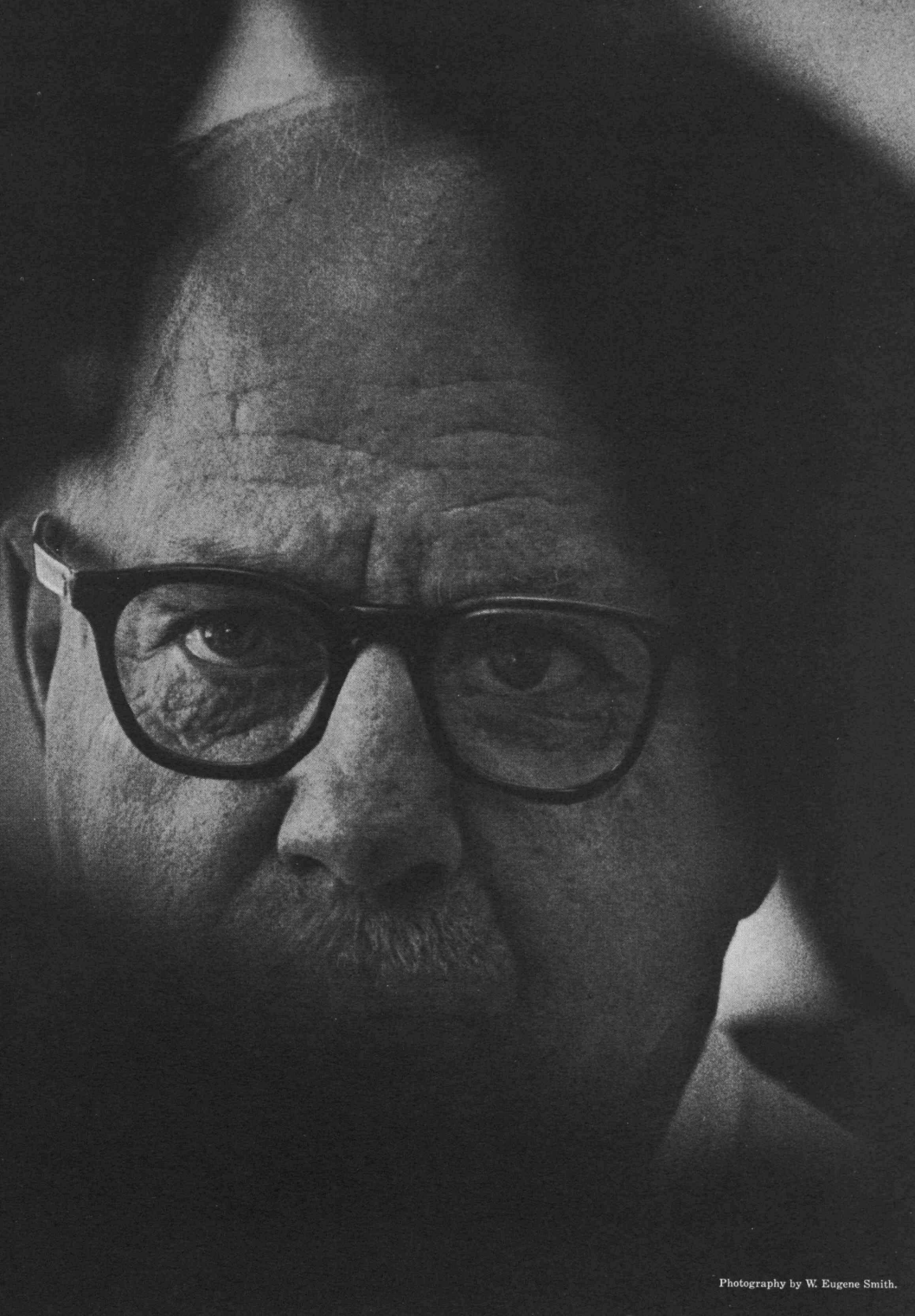
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Technology Review, Reg. U.S. Patent Office, is published nine times each year (in October/November, monthly from December through June, and in July/August) at the Massachusetts Institute of Technology.

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Inquiries regarding editorial contents, subscriptions, and advertising should be addressed to:

Technology Review
Room E19-430
Massachusetts Institute of Technology
Cambridge, Massachusetts, 02139.

Area Code 617, telephone 864-6900, extension 4871.

Technology Review is printed by the Lew A. Cummings Company, Manchester, New Hampshire. Second class postage paid at Manchester, New Hampshire.

Price: \$1 per copy, \$7 per year in the United States, \$8 in Canada and foreign countries. Please allow three weeks for changes of address, and give both old and new addresses in all requests.

Technology Review is represented for advertising by:

Good, Laidley and White,
50 East 42nd Street, New York,
N.Y., 10017, telephone (212) 986-6210.

Mediarep Center/New England,
710 Statler Office Building, Boston,
Mass., 02116; telephone (617) 426-6762.

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Next month

Technology Review for December will be published on November 20. Its contents:

Congress and the Information Revolution, by John S. Saloma, 3d, '56—how computers can be used by members of Congress to help understand problems and make decisions, and how their power may change the balance between Executive and Legislative.

Today's Crime versus Yesterday's Technology, by George A. W. Boehm, the story of an estrangement between science and social needs that has penalized law enforcement agencies and many parts of society alike.

Collagen as a Biomaterial, by Albert L. Rubin, '47, and Kurt H. Stenzel, an example of the union of science, engineering and medicine to bring new knowledge from molecular biology for man's greater health.

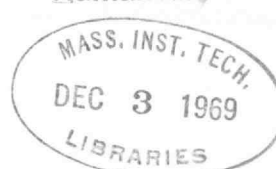
The cover

Just as the traditional values of Chinese science have been discredited by the Maoists, the circular symbol of yin and yang, which according to Chinese cosmology produces all that seems to be, is shattered by the great gold star of the People's Republic.

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The High Price of Indecision

When American astronauts land on the moon they may follow the trail of Soviet cosmonauts. Would it really matter? Would the United States really be a loser to miss its advertised goal of being first to put men on the moon?

I doubt it. This sort of "crisis" could be a healthy thing. It might help rub in the lesson that the United States should stop romancing about space races and adventure and figure out what its long-term interests in space actually are.

Today, the American space program drifts indecisively. With much cost and a decade's effort, it has given the United States an impressive space capability. The country could, in the foreseeable future, put men in orbiting stations or put researchers on the moon. It could send instruments to explore the farthest reaches of the solar system. It could greatly extend the practical uses of space typified by communications satellites or orbiting weather watchers.

But the United States has yet to decide what it wants to do with this space capability in the 1970's. And because of this indecision, it risks losing at least some of that capability as it atrophies for lack of use.

This is the specter that haunts officials, scientists, and engineers who express dismay at the slowdown in the American space program—not the strong possibility that the Russians may win the lunar race. Loss of hard-won capacity is what James E. Webb fears when he warns that the United States is turning into a second-rate space power regardless of who beats whom to the moon.

At this writing, James E. Webb had just made this statement in announcing plans to retire as Administrator of the National Aeronautics and Space Administration. But he has been stressing the need to set up long-term space goals for some time. For while Mr. Webb and his staff talk in terms of budget cuts when outlining their problems to the Congress, it's the lack of national purpose in space that basically stymies them.

With no long-range plan, N.A.S.A. gives overriding priority to the short-term

goal of putting three men on the moon next year. As funds shrink, other kinds of space activity falter.

This is where loss of space capability may set in. Among N.A.S.A.'s industrial contractors, many research and development teams are splitting up. These teams produce the tricky hardware for lunar and planetary research, for manned flights, and for all the ground tracking and other support such things require. They are groups of engineers whose ability to work together adds up to more than the sum of individual skills. They represent an intangible, highly valuable, "group competence" that's lost when teams split up.

The situation at the Space Division of The Boeing Company, which built the lunar orbiters, typifies what is happening. William C. Galloway, S.M.'48, Manager of Research and Development at the Division, says that, so far, Boeing has been able to relocate engineers from disbanded teams within the company. These men and women could, in many cases, be brought together again. But if cuts in space activity continue, Boeing may begin losing engineers to the outside. If that happens, it would take more than money to regain lost competence. Mr. Galloway says it can take as long as five years to build up a smooth-working design and development team.

Or consider the famed Jet Propulsion Laboratory, run for N.A.S.A. by the California Institute of Technology. J.P.L. has been responsible for the highly successful Ranger, Surveyor, and Orbiter programs that have photographed and probed the moon. It has fathered the Mariners that visited Mars and Venus. It embodies much of America's competence in planetary research. It, too, feels the threat of having some of that competence dissipated.

This hasn't happened yet, in spite of a 10 per cent cut in personnel. According to J.P.L. officials, staff morale runs high. Loss of key people has been small. But, the officials add that any more cuts could begin to soften the laboratory's muscle. And staff members might lose faith and begin leaving on their own account for more secure employment.

Boeing, as a contractor, and J.P.L., as a leading government laboratory, highlight the danger the American space effort faces. So far, there have been disappointments as projects have been slowed or canceled. But any further drop in activity will probably mean losing competence that will be hard, if not impossible, to regain quickly.

Long-Range Soviet Objectives

The Soviet space program, at least as seen from the West, contrasts sharply with this declining vigor. From the first, it seems to have followed a spectrum of long-range objectives. No important aspect seems to have suffered because limited funds have to be diverted to a single "prestige" project, as is the case with the American moon mission.

The Russians admittedly have not announced as many important scientific discoveries or done as much with weather and communications satellites as have the Americans. This need not indicate weaknesses in their program. They have the published American scientific reports. It's too early in the game for them to suffer economically from having a second-rate communications or weather satellite system.

On the other hand, they work doggedly at planetary exploration and manned space flight. Reviewing the Russian space program recently, George E. Wukelic of Battelle Memorial Institute listed the following as its major apparent goals:

In unmanned projects—using a mobile lunar laboratory; returning a spacecraft from the moon or its vicinity (a goal realized with the flight of Zond 5); developing rockets to orbit payloads of 100,000 to 150,000 pounds; sending probes to Mercury, to Jupiter, close to the sun, and out of the solar system altogether.

In manned projects—running orbital space stations; sending men around the moon; landing on the moon; manning a lunar laboratory; sending cosmonauts to Mars and Venus.

Mr. Wukelic noted, as have many other Russia-watchers, that "it appears clear

from past developments and current Soviet writings, which consistently emphasize manned stations and manned lunar and planetary flights, that the challenge will be greatest in the area of manned exploration."

The Hard Facts of Priorities

This challenge N.A.S.A. now must meet with a program whose main strength focuses on a lunar landing next year. N.A.S.A. at this writing was trying to live within a presumed budget of about \$3.85 billion for fiscal 1969, although its final budget had not then been fixed. It had asked originally for \$4.37 billion.

Announcing this in August, the agency candidly said only work on the Apollo moon program and space applications, such as advanced components for weather or communications satellites, would go ahead as authorized. "Activities in many other areas," it said, "have had to be curtailed, certain projects reduced in scope, and other work deferred to future years."

This severe limitation reflects the lack of vision that has crippled American space efforts since the mid-1940's. No, that date isn't a typo. The famed Atlas rocket that lofted Mercury astronauts grew out of design studies begun shortly after World War II. If the United States had moved more quickly to build on that foundation, it could have orbited satellites 15 to 18 years ago. Rocket designer Wernher von Braun once remarked, "I realized then it could not have been done because nobody was interested in this kind of thing—but from a purely technical angle I think we could have fired a satellite in 1950, 1951, or 1952."

At every stage, the United States has had the kind of space success, or lack of success, it has wanted. It entered the space age in 1957 with no goals at all beyond orbiting a few Vanguard satellites. Then, caught napping by the Russians, it overreacted to their string of early space feats. Americans are living with the consequences of that overreaction today.

The country plunged ahead into a costly space program without a clear vision of

why or where it was headed. Is it any wonder, in this time of tight money and urgent social problems, that the program flounders for want of a persuasive reason for continued massive support?

When President Kennedy announced the project to land men on the moon by 1970, he meant to give the space program purpose. He meant to pick up the Soviet gauntlet. The project has failed to do either convincingly.

In practice, the moon goal, while giving direction to the space program, also ordered its priorities. As money became tight, it has squeezed other efforts badly.

The Russians, as Mr. Wukelic outlined, seem to have aimed right along at developing their space capabilities over a broad front. The American program, oriented about its moon goal, has also been developing broad space capabilities. But for lack of long-range vision, the United States doesn't know what it wants to do with those capabilities. The program has built a remarkable government-industry team with which the United States could further open the space frontier. But the team now is being at least partially disbanded.

This is not just the result of unforeseen costs of war or urban crisis. The country has been pursuing an illusory goal in a race in which there should be no discredit in being second. If, instead, it had been trying to develop broad space capability for its own sake, it would not sacrifice most of the program when the money pinch came. It would have a better balanced program that could be more rationally adjusted to a severe budget cut.

Indeed, the budget cut in that case might not have been so great. For the costs of Vietnam and the demands of social unrest seem only excuses for a space cutback that many congressmen and many citizens have long wanted. They have felt the justification in terms of a race for prestige to be artificial. And make no mistake on this, even though there are many sound reasons for the space program, the message many people have received has been simply "beat the Russians to the moon."

If the United States is to maintain its strength in space, to build meaningfully on the foundation it has laid, the new administration that takes office next January must quickly come to grips with this problem. It will have to define a set of space objectives for the 1970's that make sense to Congress and the public and that will continue to develop the country's strength in space in all the major fields.

Robert C. Cowen, '49, is Science Editor of The Christian Science Monitor; he is a Past President of the National Association of Science Writers.

Housing Technology: An End-Run Strategy for the New Administration

Many people fear that whoever is chosen President this fall will find it nearly impossible to act decisively on domestic conflicts—even if he finds a formula for ending the war in Vietnam.

The problem is money. Taxpayers are in revolt, and most of the government's expenses are built-in and nondiscretionary. Almost inevitably, there would be little money left over for vigorous action in behalf of the old, the young, the poor, and the black. The result is expected to provoke more domestic violence, which, in turn, is likely to provoke more repressive action.

The money pressures are very real. A group of economists advising Vice President Humphrey said that even an immediate end to the Vietnam war would only make \$2 billion extra available in the first year.

And many observers feel certain that the so-called "thin" Sentinel antiballistic missile system, aimed at China and estimated to cost around \$6 billion, will inevitably be extended to a "thick" system of far greater cost. The simple reason given for this is that the aerospace industry, which Ralph Lapp calls "defense socialism," can see no other prospect of getting the growth it wants. Spending on other missile systems is leveling off, including those of the National Aeronautics and Space Administration, and the profits from domestic "jumbo jets" and "airbuses" are likely to be slim despite the huge numbers of these planes already ordered.

Behind all these pressures lies a greater one, the impatience of an American middle class with the claims of the nation's dependent classes, the old, the young, the poor and the black. People who consider themselves hardworking and self-denying are expected to revolt at the prospect that a reformed welfare system might cost 2 per cent of gross national product instead of 1 per cent today, as *Fortune* magazine predicted in its August, 1968, issue. Most middle class taxpayers feel no sense of participation in the challenge, nor are they likely to share in the quick financial benefit that will come from expanding

the purchasing power of the disadvantaged.

Opportunity from Balance

It should be remembered, however, that there are limits to the effect of this attitude. The claims of the disadvantaged will not go away. These claims are becoming more articulate, and the disadvantaged are organizing. Furthermore, the relatively gentle use of force in the riots after the assassination last spring of Martin Luther King, Jr., indicates that much of the nation's leadership has made up its mind, at least for now, to avoid the police violence that breeds more violence. This constitutes an automatic decision to try to meet at least some of the claims of the disadvantaged.

In such a situation, it is at least conceivable that the President will have considerable freedom of maneuver, granted to him by the fact that the pressures from the nation's haves and have-nots may just about cancel each other out. To be sure, the middle class may not tolerate large new outlays to give the disadvantaged more jobs, better jobs, and better housing, schooling and medical care. But that same middle class has decided, however hesitantly, not to shoot wildly in defense of property rights.

Thus it is possible that our situation should be creating pressure for solutions, not counsels of despair. It is conceivable that important new social programs can be launched using the increments to the U.S. government's tax receipts, increments made available by the expected continued growth of the economy—and by a determination to limit other claims, such as defense.

Much new money will eventually go for guaranteeing financial vigor to millions of people now trapped on the welfare rolls. Plans for a guaranteed minimum income, involving a "negative income tax" paid back to the disadvantaged through the mail with no means test, have already won the endorsement of the nation's economists. But such a drastic change will not come soon.

The next President is going to have to show some action immediately. He may find this difficult if he faces an opposite-

party Congress, but such split need not postpone implementation of some relatively inexpensive technological strategies. Some of the quickest action could come in the area of construction technology, so as to achieve dramatic reductions in the cost of houses, schools, and medical buildings.

Mobilizing a New Technology

The sort of technology which can provide cheaper housing, schooling and medical care is not all new. Mobilizing it will involve hundreds of millions of dollars rather than billions. The program will resemble the \$1 billion development of the lunar module for landing astronauts on the moon rather than the \$12 billion program for Polaris missile submarines.

The U.S. government has much experience in mobilizing rapid technological advance. Although much of the money for defense and space research was appropriated for reasons of national prestige and military power and to provide employment, defense and space programs also have brought many practical benefits, such as the rapid development of communications and computer systems. And they have trained many people to carry out very large and difficult technological enterprises.

An important, though unlooked-for, by-product of these huge programs has been that the whole population now expects benefits to emerge from organized efforts to stimulate technological advance.

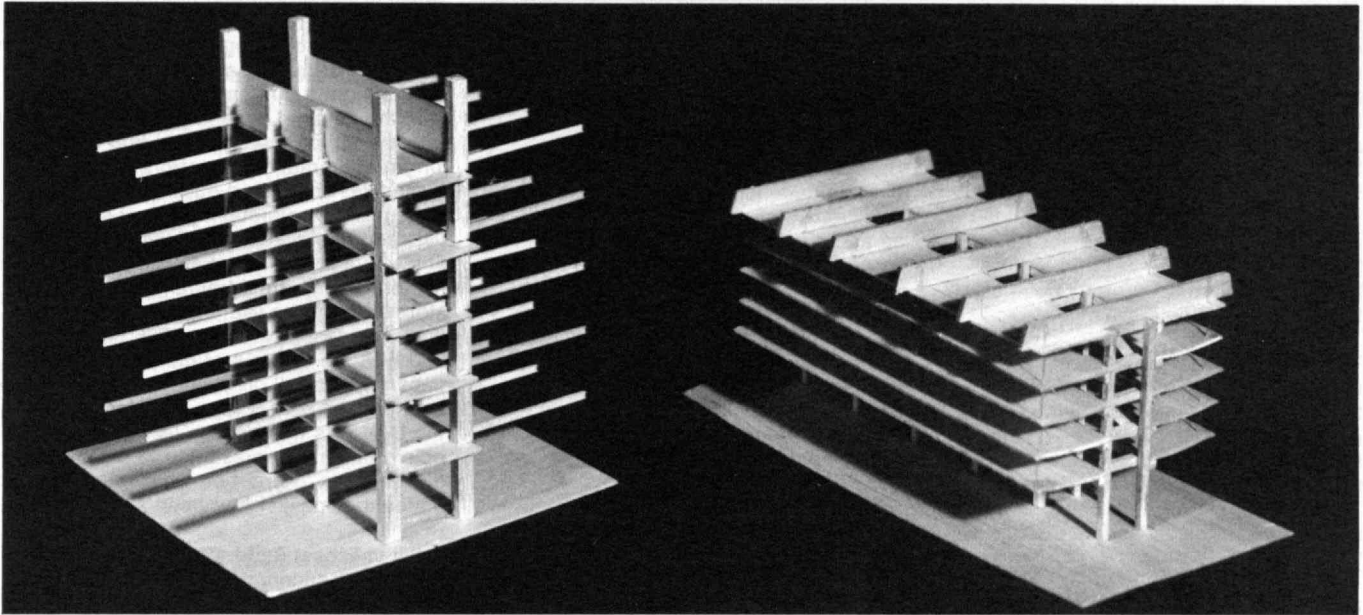
To be sure, many of these expectations are unreasonable. Time and again, Congress and the people have overestimated the productivity of spending much money very quickly on medical research or space exploration. There are limits to how much can be spent usefully, limits which are set by the number of people of high quality in a field, by the state of development of their ideas, and by the availability of equipment to examine a scientific question rigorously.

Toward a New Building Technology

It seems certain that most of these requisites are satisfied in the area of

One approach to a new technology for urban structures came out of Project Romulus, a systems analysis for a new high-density city environment completed in 1967 by M.I.T. students. It envisions housing modules which can be moved by common carrier and "plugged into" megastructures; the megastructures are either cantilevered frameworks (left) or

suspended-slab sheets. Victor K. McElheny calls technological developments in the building industry an "end-run strategy" for the Federal government to improve conditions of life in the U.S. in an era when resources fall far short of demand. (Photo: The M.I.T. Press from Project Romulus, edited by Anthony Kettaneh, '69)



building technology. There have been promising experiments with concrete, plastic and wood houses—all of them at prices near \$7 a square foot instead of the national average of \$13 a square foot for a dwelling unit (exclusive of site preparation). These experiments are being closely followed by the Department of Housing and Urban Development and by the White House Office of Science and Technology.

The next step, it would seem, should be the establishment by the government of a number of development programs, one in the construction of houses, another in school building and a third in medical construction. Leading companies, with experience either in marketing or undertaking difficult new technology, should be invited to bid for incentive contracts to develop low-cost construction as a system.

These programs might involve federal participation far smaller than the government's 90 per cent share in developing the supersonic transport (latest cost estimate \$1.5 billion). Once they were well enough along, it should be easy enough to find a locality ready to change its zoning laws to allow truly

industrialized building. And if not, the first attempts could be made on a military base. Once the concepts have been proven, restrictive local laws should yield to the new technology rather quickly.

Thus, by spending relatively small amounts of investment money, the government could mount an attack on a key component of the cost of helping the disadvantaged, freeing funds for other social programs.

If low-cost housing could be achieved, a poor family of four could occupy 1,000 square feet of floor space for an annual rent near \$700, far below the rates paid today by people on welfare. Such a rent could mean the end of costly rent supplements for welfare recipients.

Cuts in construction costs could reduce the overhead costs of running a hospital outpatient clinic or the group practice of doctors working in a comprehensive, prepaid medical care plan. They could also reduce the conflict between school districts and taxpayers over the inevitable continued expense of classroom buildings, for which taxpayers now pay

a heavy burden in building and bond-interest costs.

What is proposed here is an end-run strategy, a method of showing progress to the disadvantaged while avoiding a direct confrontation over taxes with the aggrieved middle class. Such a strategy is not new. When the U.S. government could not enact legislation for direct aid to schools, it passed laws for indirect aid, such as the small appropriations for science education which have helped revolutionize science teaching for young Americans. Indirection, and use of available technology, may produce relatively swift results.

Victor K. McElheny is Science Editor of the Boston Globe and was formerly European representative of Science magazine.

Trial Balloons at a British Free-for-All

To belong to the British Association for the Advancement of Science one need only profess to be "interested" in science. This year a full 1 per cent of all the scientists and engineers in the United Kingdom showed up for the annual meeting of the Association in Dundee, Scotland. Any of our readers familiar with Dundee will know that a meeting of 350 scientists is just about right for this town. But imagine stuffing 3,500 British blokes into 2,000 hotel beds and you'll have a pretty good picture of the situation in Dundee.

Time was when scientists in the U.K. saved their 'big ones' for presentation at the B.A., but no more. Today the B.A. consists mainly of review papers and symposia of public import. But it continues to be Britain's own free-for-all. Anything goes—and trial balloons are stock items at this sideshow. Consider these:

A suggestion that Mr. Khrushchev's downfall came because his drive for agricultural expansion failed when the weather altered unexpectedly was put forward by H. H. Lamb of the Meteorological Office at Bracknell, Berks. Mr. Lamb said that following 60 years of climate moist enough for growing grains there had been a reversion to a much drier climate—yielding only half to three-quarters of the 1890-1950 rainfall.

J. E. Gordon caused crockery makers to pale when he spoke of making fiber reinforced unbreakable teacups. Such materials, very strong and very expensive, are today being used mainly in aircraft.

Shy about your sexual and gynecological problems, are you? J. L. Gedy, Director of the Cambridge University Unit for Research on Medical Applications of Psychology, suggested that many people would rather talk to a computer. The computer impersonally asks the questions, the patient responds, and mechanical analysis produces a written report. Not even a pretty nurse to hold your hand!

Some balloons got shot down. N. Kurti of the Clarendon Laboratory, Oxford, said that the U.S. fad for cryopreser-

vation is nonsense. He said that the time lapse between death and freezing allows irreversible brain damage to occur so that revival would be useless even if possible.

More Work for Computers

Harry Kay of Sheffield University stated that the time had come for psychologists to discover the use of the computer as a tool for measuring human behavioral response. Until now psychologists have used computers only as fast data-processing devices, but their other uses should greatly advance psychological investigations. The study of decision-making techniques and consequences is a case in point, where the different strategies being used will influence results. The use of an on-line computer by the psychologist will stimulate the rapid differentiation of alternative models of decision making and result in more rapid focusing of broad investigations. Learning and perception studies where the psychologist must constantly consider the changing nature of the subject are other areas where computers could profitably be used. The biggest problem is in re-orienting the psychologist's psychology to the use of new techniques.

Donald Michie of Edinburgh (who last year taught a computer to balance a pole mounted on a moving car) is now working on an Anglo-American project to produce a computer intelligent enough to converse with man on such topics as art, literature and the problems of the universe. (Hmmm—I wonder if there would be any feedback if they use the gynecological computer for this job too? It would make Freud happy, anyway!) Dr. Michie is trying to give the computer a 2000-word vocabulary and teach it the fundamental rules of syntax. The second stage of the work to produce a thinking, talking robot will be carried out in the U.S. where the computer will be linked to another, programmed to understand the full meaning of words.

The Brain Drain

Sir Gordon Sutherland, F.R.S., Master of Emmanuel College, Cambridge, harshly criticized the U.S. for allowing the brain drain to deplete other countries of their talent. He said that the biggest

cause of the brain drain had been the commitment of the U.S. to research and development programs beyond her resources of trained manpower. He believed that the burden of decisions to limit the influx of such manpower laid with the richer countries and that in the long run international controls seemed inevitable. He pointed out that although the current immigration quota of scientists and engineers was 17,000 annually, and that existing queueing procedures meant that the drain from the U.K. was stopped for three years, the 17,000 limit was nearly twice the 1966 figure and with the U.K. out of the picture the impact would fall on countries who could afford such losses even less than the U.K. This was a much less balanced opinion than was presented in the "Brain Drain" Report on which committee the speaker had been a member.

It fell to Ernest Rudd, Essex University, to raise a cautionary voice. Summarizing his statistics, he asked whether the supposed over-all shortage of scientists and engineers in Britain existed at all. Several suggestions were made for curbing the drain by international treaty, limited term migration, or even payment by the gaining country of the education cost of the individual concerned. By far the best suggestion was that industrial organizations in advanced countries should arrange for some of their research and development to be carried out by subsidiary companies located in the developing countries.

An immediate response to Sir Gordon's tirade appeared as a letter to the Editor of the *Financial Times*. "Is our social structure placing too much emphasis on academic careers as opposed to industrial ones? If indeed the scientist is not needed in Britain then he can console himself with a three-times-higher standard of living and more leisure in the U.S. While he may miss the rewards of English life greatly, he can cry all the way to the bank."

The Impact of Television

Television programs may not always achieve the hoped-for effect, but sometimes the precise opposite. Very few impact studies have been carried out in spite of the presumed importance of

In 1910 Baedeker described Dundee as "a busy commercial and manufacturing place"; St. Mary's tower is considered "one of the noblest church towers in Scotland," but Dundee has never been on the principal tourist routes. Nor is it yet, according to Harry A. Lipsitt's account of the meeting there of the British Association for the Advancement of Science.

the medium (or is it the message?). Several recent studies reported by W. Belson, London School of Economics, indicated that an intuitive assessment of program effects can be wildly wrong. A television series designed to be helpful to viewers planning to visit France had, in fact, frightened them away. The program showed how to change money and use the Paris Metro, told what to expect for breakfast and generally tried to interest the viewers. But the program also tried to teach the viewer a minimum French vocabulary—and this caused many of the viewers to feel inadequate and become apprehensive about their trip. In a program on morality in Britain, people were so impressed by a pretty young unwed mother who was interviewed that they became appreciably more permissive about illegitimate babies.

And a program aimed at broadening peoples' understanding of the causes of Britain's present economic situation led instead to a narrowing of attitudes because viewers grasped only those points which reinforced their already held views. Such perversity is, in one sense, encouraging, but there are some programs the impact of which must be properly assessed before the programs are viewed. It is for this reason that a significant understanding of the impact of television must soon be achieved. The only technique so far useful was to explore the state of lay knowledge before the program was made, so that the broadcaster could see exactly what kind of material should be included.

Odds and Ends

A study of the effect of noise on children's homework has shown that background pop music actually improves it. One suggestion is that this covers family interference. Parents please note.

Gas chromatography makes it possible to detect as little as 10^{-9} gram of a chemical but in some cases—as oil of wintergreen and some musks—the nose is 100 times better.

The secret of peaceful coexistence with moles is to brush away the molehills and thereafter ignore the moles. Fresh



mounds are only thrown up when a new network is being established, when a tunnel is being extended, or, if the mole goes deeper in cold weather. At all other times the situation is dormant and the gardener and mole can safely coexist.

Things to Come

Ian Roxburgh of Queen Mary College, London, predicted that the sun will explode in five billion years. Man would be warned of the explosion when the sun got much brighter and began to expand to 400 times its present size. If we wish to escape we will have to use part of the earth as fuel to drive the rest of the earth farther out into space. Not to

worry—by that time we may even have the technological capacity to evacuate the earth altogether.

Harry A. Lipsitt is presently a Liaison Scientist in the Office of Naval Research, London. His normal position is Supervisor of Metallurgy Research at the Aerospace Research Laboratories and Adjunct Professor of Metallurgy, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio. He holds a Ph.D. in metallurgy from Carnegie-Mellon University. The opinions presented in this article are the author's and do not necessarily represent the attitudes of any organization of the U.S. Government.

When Form Disintegrates, Only Technique Remains

Good times require no explanation, but a disturbed society is constantly impelled to seek the cause of its troubles. The intensity of the seeking in our generation testifies to the present state of the world.

It is never difficult to find a single cataclysmic origin for social conditions. At the beginning of the Nineteenth Century, workers in the new industrial cities of England smashed the machines to which they attributed their misery. Two generations ago, in the turbulent years following the bloody horrors of the first World War, the Bishop of Ripon spoke for a widespread revulsion against science, when he urged that laboratories be closed for 10 or 20 years, or forever. Continuing this 200-year-old trend, many contemporary social analysts find the root of society's evils in the technological revolution. But today nobody knows what to close or what to smash.

The argument from technology is plausible. Such major problems as the threat of nuclear annihilation, overpopulation, depletion of natural resources, and pollution of the environment are clearly related to the technological explosion of recent decades. Furthermore, the broader, more complex problems of poverty, injustice, violence, and war have technological components.

It is not difficult to develop models which demonstrate the relationship of cause and effect technology to selected social phenomena. Many have been proposed. At best, however, such theories explain how, not why, and often they are enlightening to the same degree as the explanation that the usefulness of ether as an anesthetic is due to its soporific properties. It seems likely that any attempt to explain human and social phenomena in terms of science and technology must of necessity end in tautology, for the two realms are not commensurate.

André Maurois has written in *Illusions* (New York: Columbia University Press, 101 pp., \$4.95): "We shall see that science fundamentally consists of purging phenomena of . . . the human sentiments which we foist upon them. Conversely, we shall find that the arts introduce into

the world of facts and things . . . the highest possible proportion of humanity as a whole. Science and the arts would thus seem to be complementary."

It may be then that the arts are a suitable starting point for understanding the character of a society in which technology plays so dominant a role.

Art as a Means to Understanding Society

This is the approach taken by Erich Kahler, historian and critic, in *The Disintegration of Form in the Arts* (New York: Braziller, 133 pp., \$5.): "What I want to discuss . . . does not concern art alone, or art *per se*. . . My principal purpose . . . is to put [art] movements in a broader perspective, to show them, *first*, as results of general social and civilizational developments, *second*, as symptoms of our present human condition, and *third*, as agents prominently contributing to what I consider an extremely dangerous trend of events."

We may grant in advance the feasibility of the first two purposes. The third, however, embodying the idea that the arts—literary, dramatic, plastic, musical—can influence events at all, especially in modern times and in dangerous directions, is so startling that we may wonder if the author means what he seems to be saying. He does, but in a particular sense related to the significance he attaches to form.

Dr. Kahler considers form to be the primary, indispensable criterion of art. Inherent in the meaning of form are the concepts of wholeness, of coherence, and—since existence is in time, as well as space—of history. These are qualities by which a thing is what it is; they constitute identity. In fact, form may be understood as identity, and losing form is the same as losing identity.

There have been epochs in which old forms were discarded on a grand scale. A notable example is the period of the late Nineteenth and early Twentieth Centuries. Fauvism, Dada, pointillism, cubism, the surrealist movement were all attempts, exuberant and extreme, to create new forms in painting. (It is interesting that some of them overflowed

into other areas of expression.) At the same time, Joyce in the novel, Pound and Eliot in poetry, Schönberg in music were working toward forms so different from the old that they outraged most contemporaries.

The predominant characteristic of much of the art of our time, Dr. Kahler shows, is the abandonment not only of old forms, but of *all* form. "I do a picture," Picasso said, "—and then I destroy it. . . . You must always start with something. Afterward you can remove all traces of reality." In contrast, the contemporary painter Okada, rejecting conscious control, says, "Start with nothing and let it grow."

The novelist William Burroughs states, "I write about what is in front of my senses at the moment of writing. I do not presume to impose 'story' or 'plot' or 'continuity.'" Similarly distrustful of everything but the immediately present, the French *nouveau roman* (whose influence can also be seen in the "new wave" films) concentrates on recording in surreal detail the objects around humans, who themselves are reported only in terms of their overt, observable responses.

John Cage instructs composers to "give up the desire to control sound, clear [the] mind of music and set about discovering means to let sounds be themselves rather than vehicles for man-made theories or expressions of human sentiments." (The language is strikingly similar to that of Maurois—who is talking about science, however, not art.)

In this milieu, language becomes detached from communication, losing first its emotional—that is, human—content, as in the "new novel"; then its syntactic and logical content, as in certain kinds of automatic writing and the random association of sounds in the "audiopoem"; and finally, everything except typography, as in geometrical arrangements of words and fractions of words.

These characteristics are certainly not representative of all artists and all the arts in our time. Nevertheless, Dr. Kahler

does not permit us to be comforted: "Many people, including intellectuals, are inclined to consider these movements as vogues of folly that will pass. But it seems to me that they are to be taken very seriously. They are the outcome of an evolutionary trend, a consistent and broadly human development."

The Breakdown of Total Awareness

The evolutionary trend to which the artists of these movements are responding is essentially a breakdown in connectivity—between man and the world, among men, and within each man. The exploration of the unconscious, undertaken so hopefully by scientists and artists, has failed to fulfill the promise of uniting the conscious and hidden halves of man into a total awareness of self. The motives and behavior of men in relation to each other and their societies seem to become increasingly irrational, even in terms of self-interest. Social systems have been driven to a complexity beyond comprehension by a technology that expands without limit and with no apparent relation to human purposes. Events can be grasped, it seems, only moment by moment, isolated from past and future.

This is the world—fragmented, without coherence, ahistorical—in which the artist works. Therefore he must make a choice; to create form and wholeness out of fragments or to reflect the incoherent world in his work. In our time, some artists have chosen the second alternative, and the consequence is significant beyond the arts. Dr. Kahler writes: "Form and content are only two aspects of one and the same thing: the what determines the how. Recently, however, the order is reversed: the how not only determines, it downright constitutes the what. It is no accident that in our days a . . . slogan was so persuasively raised, proclaiming that the medium is the message."

This is the message: when form disintegrates, only technique remains.

Form as the Criterion of Science

Since what remains is necessarily supreme, technique has become not only the measure but also the meaning of aesthetic value. This is the context in

which to consider Warhol's Brillo boxes, Tingeley's self-destroying sculptures, and the infatuation with the tools and methods of science that can turn into gadgetry in the hands of artists.

Of all the qualities that an artist must have, technique is the easiest to impart, to acquire, and to appreciate. The proliferation of art schools and artists, of shows and galleries, as well as the growth of the art market, should surprise no one.

The analogous situation in science is described by the fashionable and revealing phrase, "doing science." Each year the colleges and universities provide thousands of students with the current academic tools and the requisite methods, and send them out to do science. And they do science, clogging the journals and the libraries, although the value to them and to society still remains unexamined.

Science, like art, is more than technique: form is the essential criterion. Incoherent though the world may be, it is nevertheless a human necessity to re-create and re-establish coherences. If the transformation of men and cultures make existing forms obsolete, new ones must be evolved. The total abandonment of form removes from societies of men the element that is specifically human, leaving only sterile, mechanical manipulations. Doing science or art is not the same as being a scientist or an artist.

In Brief

American Indian Painting (Albuquerque: University of New Mexico, 429 pp., \$25.) by Dorothy Dunn is concerned with the art of the peoples of the Southwest and Plains areas over a period of 10,000 years. The continuity from the earliest line engravings on bone to the drawings and paintings of this decade is clearly established by the abundant illustrations, many in color.

Miss Dunn's emphasis is on the modern schools of painters, whose problem is not to create new forms but rather to reconcile the two cultures in which they live and within which they choose to

work. This they have done by subtly altering, while they perpetuate, the traditional forms of the past, so that their painting is identifiably Indian. A consequence of their solution of the problem is a degree of unavoidable sameness.

Miss Dunn has lived and worked among the people about whom she writes. Her book is an important history and demonstration of the talent that springs from an ancient and still vital culture.

In *The Nature and Art of Workmanship* (Cambridge: Cambridge University Press, 101 pp., \$4.95) David Pye, Professor of Furniture Design at the Royal College of Art, London, never uses the words *form* and *content*, but an awareness of the relationship is implicit in his treatment. Without considering workmanship as an end in itself, he is convinced of its importance in determining the quality of our environment.

His analyses of the relation of workmanship to design, the meaning of quality, and the aesthetics of workmanship are acute. The spirit of his approach is suggested by the first two of the several dozen unusually fine photographs in the book. He shows us an elegant Victorian drawing-room cabinet and the top of a pull-tab beer can, and explains why both must be considered excellent pieces of workmanship.

New from the M.I.T. Community

Talks With Social Scientists, Charles F. Madden, Editor. Carbondale: Southern Illinois University Press, \$5.85. Conversations recorded during a series of courses at several co-operating colleges, including a discussion of ethical relativism by Huston Smith, Professor of Philosophy at M.I.T.

Policy Simulations with an Econometric Model, Gary Fromm, S.M.'58, and Paul Taubman. Washington, D.C.: Brookings Institution, \$6. The Brookings computer-based model of the U.S. economy is used to analyze the impact of financial policies, including changes in the level of government expenditures and income and excise rates and Federal Reserve open-market operations and bank requirements, on economic performance.

Edwin Kuh, Professor of Finance at M.I.T., was among the principal investigators on the project.

The Nature of Physics, R. Bruce Lindsay, Ph.D.'24. Providence: Brown University Press. A compilation of personal reflections on the method and history of physics, the logical structure of physical theory, some philosophical problems in physics, and the future of this scientific discipline.

The Government of Science, Harvey Brooks. Cambridge and London: The M.I.T. Press, \$10. Eleven essays by Harvard's Dean of Engineering and Applied Physics on national perspectives of science and science policy-making

Proletarian Writers of the Thirties, David Madden, Editor. Carbondale: Southern Illinois University Press, \$6.95. Fifteen original essays on the works of writers with the "common man and his anguish" as their central theme. The contents include "The Education of Michael Gold," by Michael B. Folson, Instructor in the Department of Humanities at M.I.T.

Construction of Structural Steel Building Frames, William G. Rapp, '22. New York: John Wiley and Sons, Inc., \$12.95. A summary of all aspects of safe and economical steel erection, emphasizing the need for co-operation between designers, fabricators, general contractors, and erectors.

Criteria for Scientific Development: Public Policy and National Goals, Edward Shils, Editor. Cambridge and London: The M.I.T. Press, \$8.95. A collection of articles on science policy and policy-making drawn from the British journal *Minerva*, itself devoted to improving "the understanding of scientific and academic policy."

Magnetic Recording in Science and Industry, Charles B. Pear, Jr., '39. New York: Reinhold Publishing Corporation. A reference book on all aspects of magnetic tape recording stressing practice over theory. There are sections on principles of magnetic recording, properties of materials, general equipment, specialized accessories, and applications.

Mechanical Processing of Materials, Serop Kalpakjian, S.M.'53. Princeton, Toronto, and London: D. Van Nostrand Company, Inc. A textbook intended for a one-semester course in mechanical processing of materials, balancing theory and application but emphasizing analysis and the quantitative relationships between material properties and process variables.

Joseph Mindel is a member of the M.I.T. Lincoln Laboratory. (The notes "New from the M.I.T. Community" have been prepared by the editors of Technology Review.)

Harland Manchester

A Cheerful Prophet on Energy for Man

The Conquest of Energy, by George Russell Harrison. New York: William Morrow and Company, Inc., \$6.95.

In his third book for lay readers, George R. Harrison, Dean Emeritus of the School of Science at M.I.T., traces the impact of power and fuel utilization on man's development and discusses technical progress in related fields. Spanning the centuries from the Egyptian *fellah* who pumped water with his feet to today's devices which do the job for less than a cent an hour, he leads the reader through the various stages of steam, electricity, internal combustion, reaction motors and nuclear fission, stressing the labor-saving factors and the economics of each area of the power spectrum. He discusses the world's energy reserves, food and water supplies, mineral resources, population and pollution problems, and in the current fashion peers through a crystal ball at the year 2000.

The book opens dramatically with personal recollections of the Great Blackout of 1965, when 30,000,000 people were rudely reminded of their virtually complete dependence on electric energy in the conduct of their daily lives. Setting the clock back to the colonial housewife with her wood fire, spinning wheel and churn, Dr. Harrison introduces pioneers Newcomen, Watt, Faraday, Henry and their like and gives a lucid, readable account of the long procession of discoveries and inventions that have brought about our energy-affluent society.

Particular attention is paid to the origins and progress of nuclear power, from the discoveries of Thomson and Roentgen down to the newest commercial reactors. There follow discussions of magneto-hydrodynamics, the possibilities of the breeder reactor, and the immense promise as well as the barriers in the way of fusion power. While the author sketches in the scientific background of these projects, his clarity and his gift of coining analogies should bring the book into the comprehension range of the nontechnical reader. It should be useful to the liberal arts student from the high school level on, to the business executive or to the legislator.

Many developments which have made headlines in recent years are described and evaluated. Passages on the laser, thermoelectricity, the fuel cell, the heat pump, solar energy conversion, desalination of seawater, the prospects of the electric automobile, algae farming, and half a hundred other current projects should help readers to amplify news reports.

Dr. Harrison is a more cheerful prophet than many current seers. He considers the world's material problems soluble, mainly by a great increase in the use of energy, especially electrical energy. This new wealth of energy, along with population control and new synthetic foods, should suffice to banish nutritional deficiency diseases from the earth, he believes. He also expects extensive progress in the next 32 years in cleaning up the air and the rivers. Let us hope he is right.

Harland Manchester is one of the "deans" of U.S. science writers; he is a Roving Editor of Reader's Digest.

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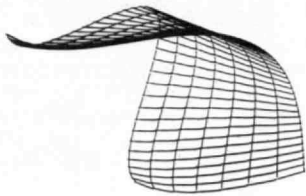
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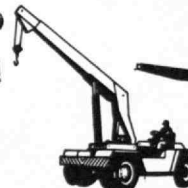
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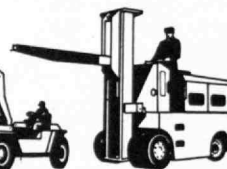
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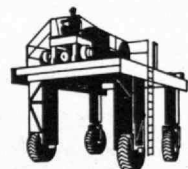
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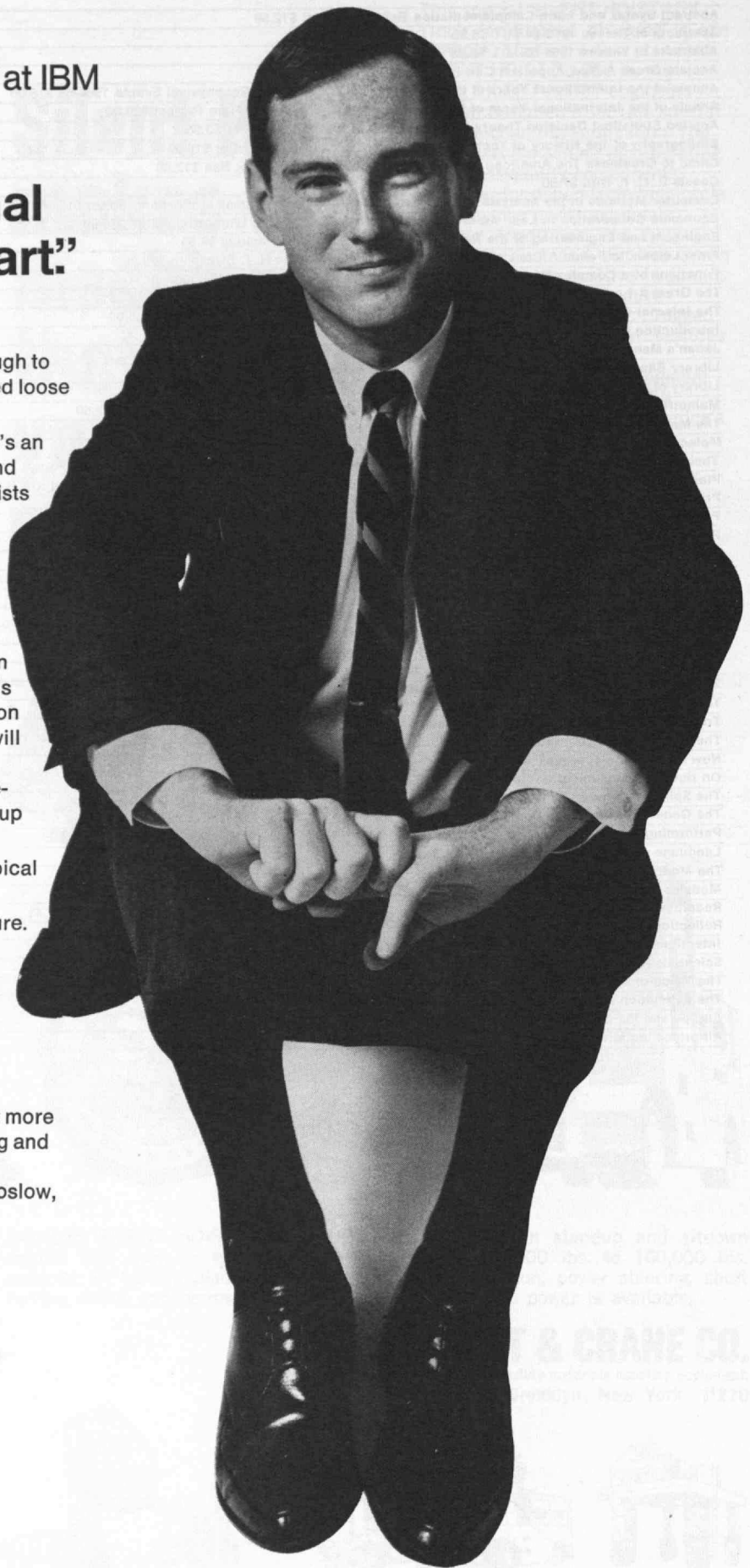
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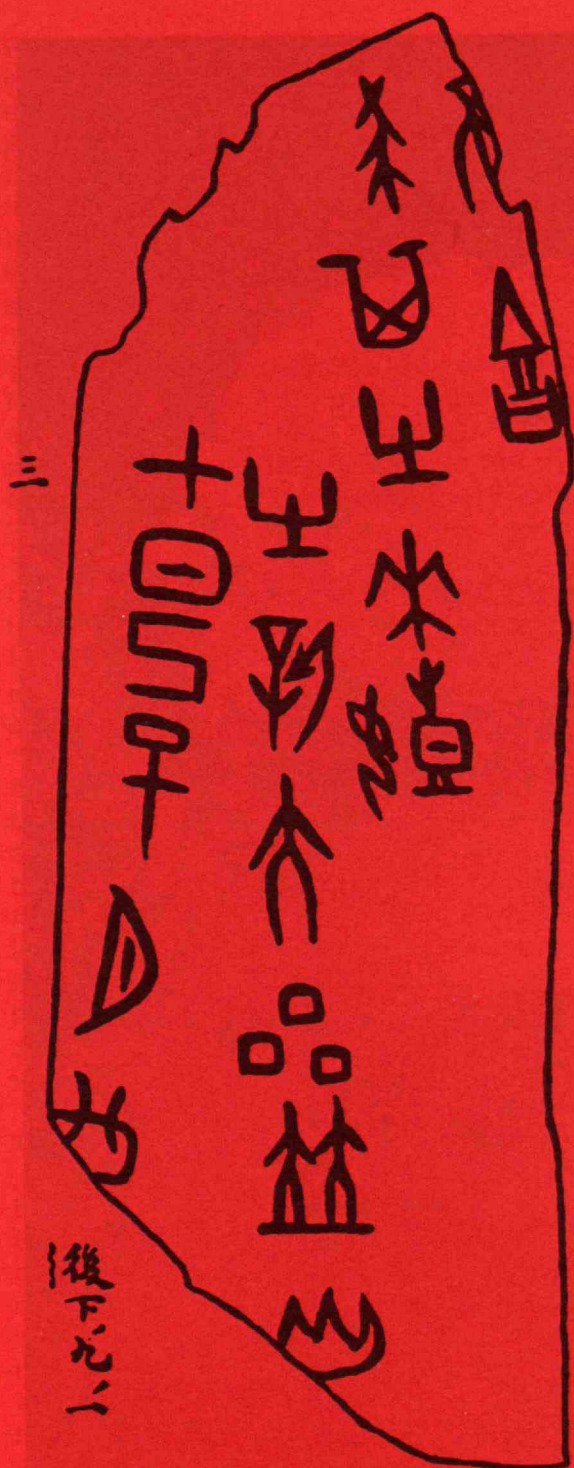
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The Cultural Revolution:

New Prospects for Chinese Science

Chinese Science and Technology in the Cultural Revolution



China and the Western world have jointly erected such barriers to intercommunication that only sketchy evidence about Chinese technology is now available to Western "China-watchers." Reviewing it, two of them—C. H. G. Oldham of the University of Sussex and A. Doak Barnett of Columbia University—reach remarkably dissimilar conclusions about the effectiveness of modern Chinese science in the service of that nation's development.

Will science prosper under the "relevance" criteria of the Cultural Revolution? Or will the emphasis on dogma force China away from the processes of modernization in which technology has so central a role? These two papers, published on the following pages of *Technology Review*, were prepared for a symposium held on Alumni Day at M.I.T. last June.

In no other land is there a longer record of scientific achievement. "On the seventh day of the month a great new star appeared in company with Antares"—the inscription on this Chinese oracle bone dating from about 1300 B.C. It is the most ancient known record of a nova observed from earth.

The Western world awoke to a new reality when the Chinese People's Republic exploded its first hydrogen bomb in October, 1967. Since then the Cultural Revolution has in some measure modified both the strength and thrust of Chinese technology. The result, writes C. H. Geoffrey Oldham, is likely to be "a greater concentration of scientific effort on problems of direct relevance to China's development needs." (Photo: Hsinhua News Agency)



Since 1966 China has established new criteria of "relevance" which promise greater use of technology in that nation's future development

C. H. Geoffrey Oldham
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Chinese Science and the Cultural Revolution

For only two of the 19 years since the establishment of the Peoples Republic of China, from mid-1964 to mid-1966, has it been relatively easy for the non-American Westerner to visit China. During this brief two years several scientists traveled to China as tourists, visited research laboratories and universities, and were able to form an impression of the scientific and technological work in their own scientific disciplines.

The same two-year period marked the beginning of formal scientific relations between China and several Western countries. There were, for example, scientific exchanges between the Royal Society and the Chinese Academy of Sciences and between the French and Chinese governments, and there were official visits to China by scientists from Canada, Australia and many other Western countries. The National Academy of Sciences in the United States established a committee to try to establish scholarly exchanges between American and Chinese scientists.

At this time there was also a flourishing exchange of scientific journals. Scientific visitors to China almost invariably commented on the excellence of Chinese collections of foreign journals, and many noted the up-to-date knowledge of international science on the part of their Chinese colleagues. The quality of the Chinese scientific publications had steadily improved and by 1965 at least three of these journals were translated in the United States and published in English.

The general impression to be gained both from the journals and the visits of foreign scientists was that the calibre of Chinese research was sound—but that few spectacular breakthroughs had been made or were likely in the near future. The adjective most frequently used by foreign visitors was "sensible." In my visits to the Geophysical Research Institute of the Chinese Academy of Sciences, for example, I noted the excellent library facilities, the unsophisticated instrumentation, and the fact that a lot of effort went into interpretation. The

Chinese geophysicists were aware of work in the West and on one occasion referred to a comparison of some of their work with results "obtained by Frank Press (now Professor of Geophysics at M.I.T.) in America."

But in mid-1966, when the Cultural Revolution began, international contacts were lost. No Chinese scientific journals have been received in Britain since October, 1966, and I suspect none has been published in China since that date. We know, for example, that in 1966 approximately 650 journals and magazines of all kinds were available for internal subscription in China; now there are only about 50. The Royal Society exchange was also suspended in the fall of 1966, and very few Western scientists have visited China since then.

Virtually the only sources of information about science in China today are Chinese press reports and broadcasts. The information which they provide is scanty and frequently conflicting, and almost all of it reflects the views of those loyal to Mao Tse-tung.

Under these circumstances it becomes very hazardous to attempt an evaluation of the effect of the Cultural Revolution on Chinese science. It is possible to discuss Chinese policies which affect science and scientists, but it is almost impossible to determine how successfully the policies are implemented, and it is even more hazardous to speculate on whether, given Chinese conditions and goals, the policies are right or wrong.

Historical Background: Confucianism and the Status Quo

There are a number of background facts about the historical development of Chinese science which are essential to a proper understanding of present events in China. I list these with the minimum of comment:

1. Although historically China has made many technological innovations, her scientists never dis-

**"Dare to do, dare to think,
break conventions . . . What is
still unknown must be
discovered . . . Do not be
overawed by scientific
authorities . . ."**

— Mao Tse-Tung

covered the 'scientific method.' The Scientific Revolution which took place in Western Europe roughly 300 years ago occurred in China only in recent times. At least part of the reason probably lies in the nature of Confucianism, whose advocacy of the *status quo*, its veneration of tradition, and its belief in an hierarchically ordered society are the very antitheses of the values implied by science. This conflict is of considerable significance today in China. The Communist government has found that old traditions linger on, and it is using science to combat traditionalism and to prepare for the new society of the future.

2. The first Opium War (1839-1842) brought home to the Chinese the fact that foreign technology was in many respects superior to Chinese technology. This marked the beginning of a conscious effort on the part of some Chinese to acquire modern science and modern technology. The efforts had only limited success until after the overthrow of the Manchu Dynasty in 1911.

3. Another important landmark in the history of science and politics in China was the debates on "scientism" which took place, mainly in Peking, in the early 1920's. These debates, which involved most of the leading intellectuals of the day, appear to have had a major impact in shaping the future science policies of both the Nationalists and the Communists. After them the Nationalist government increased its expenditures on science and helped to create research institutes, academies, libraries and universities. As a result, despite the upheavals caused by the Sino-Japanese War, there existed in China at the time of the Communist victory a well-established science system.

4. The buildup of science by the Communists during their first 10 to 15 years in power has been well documented in a number of studies mostly carried out in the United States. They have shown that approximately 1.3 million scientists and engineers have been trained in full-time institutes of higher education in China between 1949 and 1967. Some

have been employed in research, either in the research institutes of the three academies of sciences or in the institutes of a number of government ministries; but most have been employed in design and production work. The Communist government repeatedly stated that its basic policy on science was that 'science must serve the people.' More than most governments in developing countries, it enunciated specific policies which helped relate investments in science and technology to national goals.

With this historical perspective, it is now appropriate to turn to the Cultural Revolution, discussing first its impact on Chinese scientists themselves, and second, the effects of the new policies for the use of science to meet national goals.

The Cultural Revolution and Scientific Policy

"China watchers" are now aware of a series of disputes between different members of the Chinese leadership on a whole range of scientific and technological issues which have been a part of the ferment of the Cultural Revolution. The arguments are usually polarized into two extreme views. One set of views are ascribed to Liu Shao-chi and are presumed wrong. The other views are ascribed to Mao Tse-tung and are assumed correct. It is his doctrine that every Chinese scientist is required to use as a guide to "correct ideological thinking" and as a research tool: "Dare to do, dare to think, break conventions . . . What is still unknown must be discovered and invented . . . Do not be overawed by scientific authorities—always be willing to challenge their beliefs."

Scientists were singled out for special treatment when the "ground rules" for the Cultural Revolution were first laid down by the Central Committee of the Chinese Communist Party on August 8, 1966. Item 12 of the 16-item communique stated that as long as scientists, technologists, and their staffs "are patriotic, work energetically, and are not against the party and socialism, and maintain no illicit relations with any foreign country, we should

in the present moment continue to apply the policy 'unity, criticism, unity.' Special care should be taken of those scientists and technical personnel who have made contributions . . . to help them gradually transform their world outlook and style of work."

It is clear from this statement that many scientists still did not follow the views of Mao Tse-tung but that the Chinese government recognized the important contributions which scientists were making to China's development and decided that scientists should receive special treatment. What is meant by the word "illicit" is not clear—but it is evident that any contact between Chinese and foreign scientists must be on the basis of a formal agreement.

Reports which have appeared in the *Peoples Daily* during the past year suggest that item 12 has not been upheld. It seems that at the time the communique was issued the top leaders in the Academy of Sciences were supporters of Liu Shao-chi. The ensuing months of 1966 and early 1967 saw a struggle for power in the institutes of the Academy, with pro-Mao groups trying to take over the leadership. The *Peoples Daily* reported on one occasion that 20,000 revolutionaries from the 50 or so institutes of the Academy in Peking were involved in attempts to seize power; but the pro-Mao group split into rival factions and for 20 days 'civil war' waged between the two pro-Mao groups.

In April, 1967, the main crimes of those scientists loyal to Liu Shao-chi were listed at a large rally in Peking. The scientists were accused of promoting research which was aimed at restoring what was ancient and worshiping what was foreign, advocating research that was theoretical and divorced from the needs of the country, supporting the award of academic degrees and scholastic titles such as professor, and calling for high salaries for scientists.

By July 30, 1967, the pro-Liu group had apparently been ousted from the leadership, and a new revo-

lutionary committee was established which was the Academy's organ of power. Several things are of special interest about the new committee: the army is represented, and hence the military is in a position to influence the direction of civil science; and two of the members are Chu K'o-chen and Wu Yu-hsun. The two have been Vice Presidents of the Academy for many years and hence have retained their former positions.

It is perhaps significant that the two major scientific achievements most widely publicized in the last few months have fallen within the areas of responsibility of these two men. The first was a major scientific expedition to the environs of Mount Everest; major expeditions are the responsibility of Chu K'o-chen. The second was the construction of a new radio telescope; physics is the responsibility of Wu Yu-hsun.

Quarrels over research priorities and over the leadership within research institutes are not unique to China. But three examples serve to illustrate how all-pervading are these disputes in China's case.

Three Examples of Policy Conflict

All countries (not only developing nations) are faced with the problem of choice of technology. This is a complex issue, but it frequently boils down to a decision on whether an enterprise should invest in capital-intensive or labor intensive-techniques. The prevailing view in China is well illustrated by the problem of agricultural mechanization.

Both Mao Tse-tung and Liu-Shao-chi are agreed that in the long run China must have the most advanced agricultural mechanization. They differ only in the tactics to be followed. Their views are reflected in what happened in Heilungkiang Province in the extreme Northeast of China. Liu argued that the province's tractor resources should be concentrated and put to work in those areas where there was likely to be greatest economic return—

Scientific institutions and scientists have been caught up in the turmoil and confusion which characterize China today. The cultural revolution has resulted in new priorities.

where there were large areas of arable land and few draught animals. He suggested that it was not sensible for each commune to have its own tractors; instead there should be a number of state tractor pools which would—on a contract basis—be deployed when and where they were most needed. Each pool would have experts who could keep the equipment repaired and would be able to manage the operation efficiently.

Mao's policy is that the State should encourage innovation at all levels. Hence those communes which wish to have their own tractor stations should be allowed to do so, and every peasant should be encouraged to innovate. In line with this policy Mao also favored research in semimechanization techniques, and at the time of the Great Leap Forward (1958) he set up dozens of semimechanization research institutes throughout the province.

When the supporters of Liu were in control (1961-1967) they argued that the research resources should be concentrated in a few centers and that priority should be given to developing advanced agricultural mechanization and not semimechanization. They therefore disbanded "dozens" of the semimechanization institutes.

For advocating his policy Liu has been accused of being pragmatic and of putting economic before social and political considerations. The difference of policy is symptomatic of a much deeper debate on national goals, and it is difficult if not impossible for us to pass judgment on who is right and who is wrong. If economic growth is to be regarded as the main objective, then Liu-Shao-chi's policies undoubtedly make good sense. But if the creation of a new type of society in which the individual is made to feel he counts is the goal, then Mao's policies are the more attractive ones.

Another problem for scientific and technological policymakers in all countries is to decide on the extent to which the country should rely on foreign technology and the extent to which it should do

its own research and development work. That China is faced with these problems is illustrated by the controversy over how to obtain oceanic cargo space. There were three alternatives: she could build her own ships, she could buy them from abroad, or she could charter ships. Liu Shao-chi said it made economic sense to buy or charter ships abroad. Mao argued that China should be self-reliant and that she should herself build a number of 10,000-ton-class ships.

Mao won this round, but then came the question of the engine to power these ships. In the past China had only built diesel engines of up to 2000 H.P. The new ships would require 8000-H.P. engines. Import the technology from abroad, said Liu, and a foreign company was invited to propose a licensing agreement. It was rejected, however, because the price was called exorbitant and there were "limiting clauses." Mao decreed that China would do her own research and develop her own 8000-H.P. diesel engine. The engine was duly built in China, and China's self-esteem was enhanced by the successful trials of her first 10,000-ton-class ship, a ship built entirely in China with Chinese know-how.

Still another aspect of China's progress, the area of defense research and development, is dogged by Mao vs. Liu disputes. The decision to build an atomic bomb was probably taken in 1958 after a difference of opinion between Mao and Liu. Liu argued that China should rely on the Soviet Union for atomic weapons. Mao disagreed. China's atomic bomb program reached fruition six years later with the explosion of China's first atomic bomb. Since then China has exploded several others, including a hydrogen bomb.

It is on education policies, however, that the sharpest and perhaps most significant differences between Mao and Liu can be found. The 19-year period of Communist rule in China has been characterized by two educational trends—continuing emphasis on scientific and technical education,

and an alternating policy of greater and then less emphasis on political and ideological education. My first visit to Chinese universities and schools coincided with a period when Liu's supporters controlled educational policies, when the emphasis was on quality and expertise with a minimum of concern with politics.

Now it is these policies which are condemned. Liu Shao-chi and his supporters are accused of setting up, in 1961, a system of "elite" schools throughout each of the provinces. Liu's plan was to single out roughly 25 per cent of all schools for special support; students could enter the "better" universities only if they had graduated from one of these "elite" schools.

It is now claimed that this system promoted elitism, and the whole policy, remarkably similar to the British system of secondary education, is thoroughly condemned. The Peking Union Medical College, originally set up many years ago with Rockefeller money, has come under especially bitter attack. From its eight-year course have come the best doctors in China; now the course is called too intensive, involving too many irrelevant facts and leading to the training of doctors who were so specialized and dependent on expensive equipment that "they were like cripples without crutches" when they came up against practical problems.

The present emphasis is on drastically curtailed courses and on a totally different form of education. Educational innovations introduced by Tong-chi University in Shanghai are being promulgated as an example for others to copy. This university was one of the foremost technological institutions in China. Now its course has been cut from five years to three, and the teaching function has been combined with design and production work so that only about half of the students' time is spent in the classroom. This new type of education is claimed to be much more consistent with what is needed for a country in China's state of development.

Such major curriculum reforms, combined with policies which make it even more difficult for children from nonpeasant and nonworker families to gain entry to higher education, are bound to have profound implications for China's long-range development.

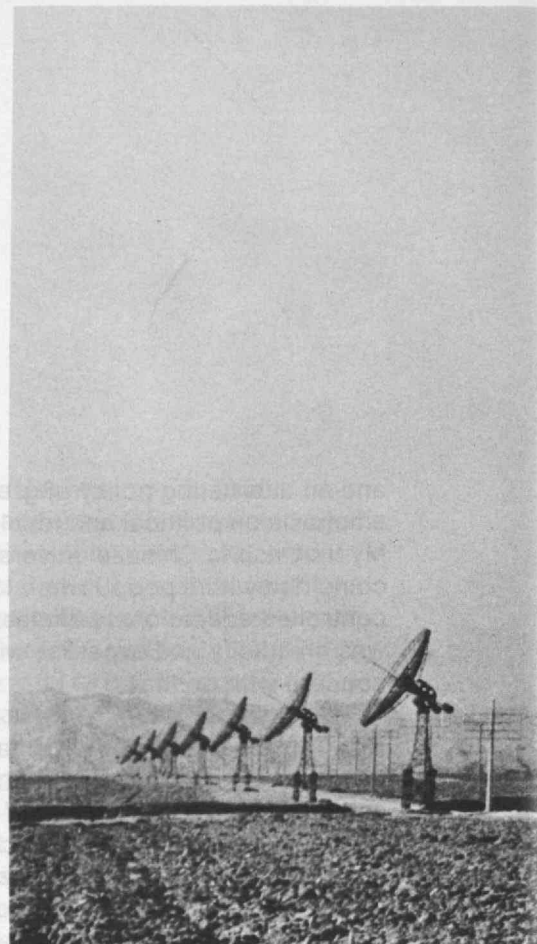
Toward the Relevance of Scientific Progress

From even this superficial survey of the effects of the Cultural Revolution on Chinese science and technology, I think it is clear that scientific institutions and scientists have been caught up in turmoil and confusion which characterize China today.

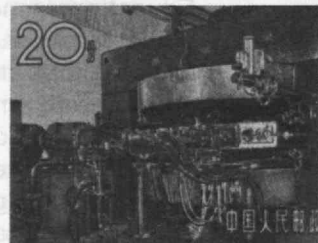
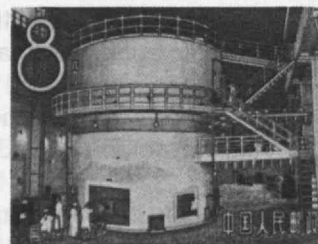
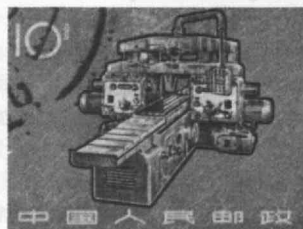
Nevertheless, announcements continue of new scientific and technological achievements, including the synthesis of insulin, completion of the world's first synthetic benzene plant, development of an automated pure oxygen topblown steel converter, and design of a new double-light-beam infrared spectrometer and an automatic stereo camera—all in addition to the well-known nuclear successes.

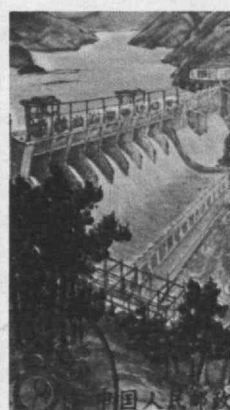
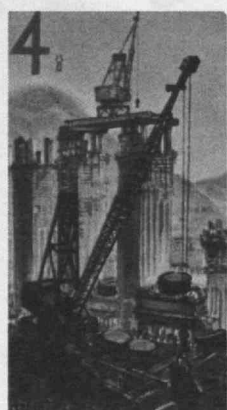
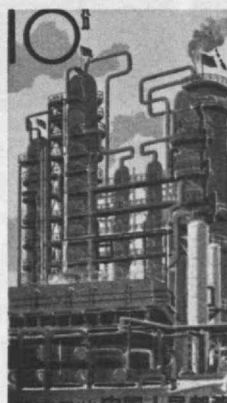
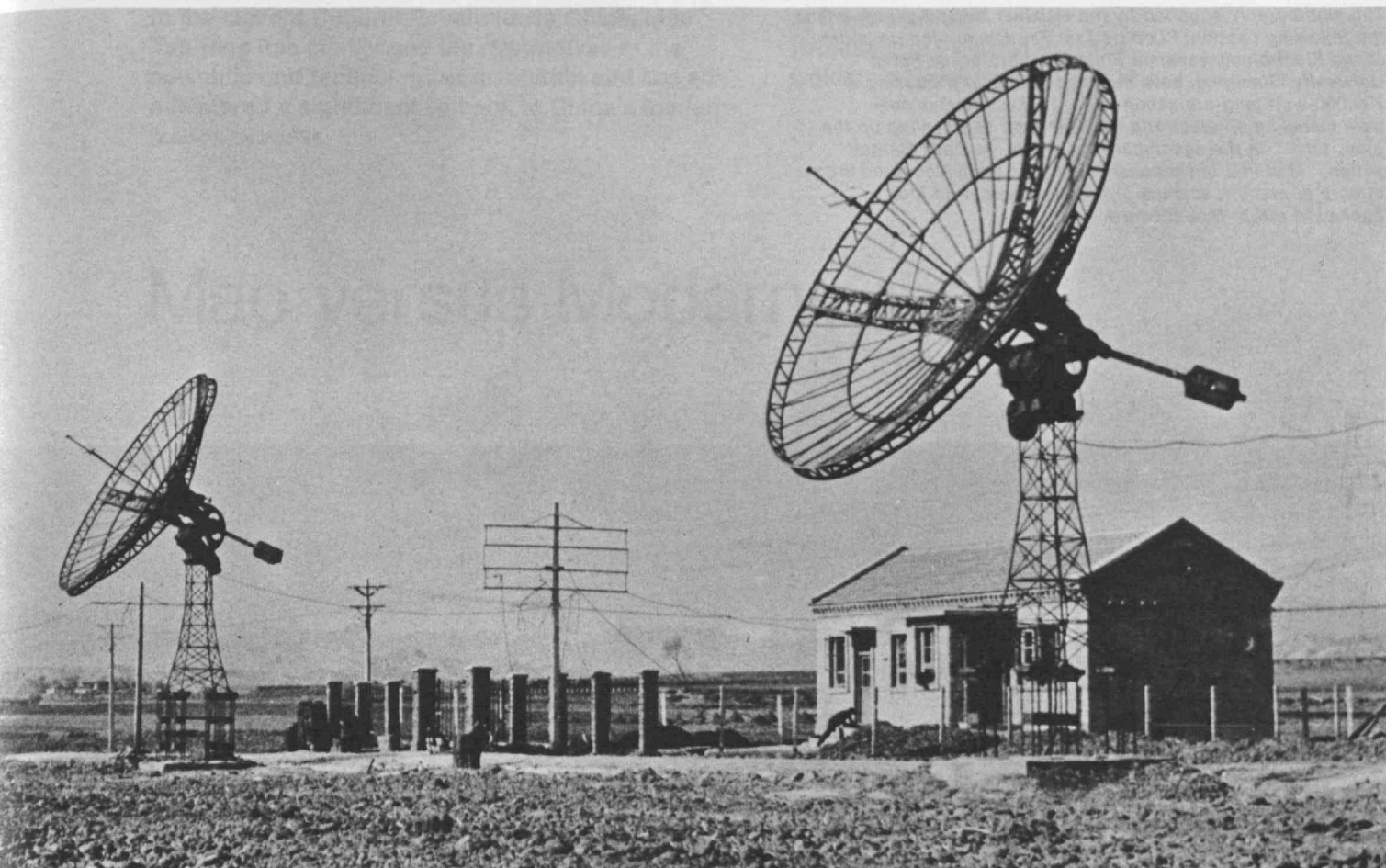
But these are isolated successes, not centrally related to China's new target for scientific and technological development. For the Cultural Revolution has resulted in new priorities. There is less likelihood of progress across a wide scientific front. The new policies are more likely to result in a greater concentration of scientific effort on problems of direct relevance to China's development needs. This is a policy which I would endorse.

C. H. G. Oldham is Senior Research Fellow at the Science Policy Research Unit of the University of Sussex, England. He is considered one of the West's best-informed students of Chinese science; and he also directs a research program on science policies in developing countries. His education in physics and geophysics was completed at the Universities of Reading (England) and Toronto.



Radio astronomy is one example of the isolated scientific successes achieved by the Chinese Communists. The pictures show a radio telescope antenna array designed to receive, solar radiation, and scientists measuring solar radio-frequency radiation at 19,200 feet above sea level on Mount Jolmo Lungma. Both projects, writes Dr. Oldham, fall within the responsibilities of two Chinese scientists whose authority has survived the Cultural Revolution.





Science and technology have a place—albeit a relatively small one—in the philatelic propaganda of the Chinese Communists. These stamps show the new Peking planetarium (1958), such new industrial developments as a large milling machine and Van de Graaff accelerator (1966), China's first nuclear reactor and its cyclotron (1958), petroleum industry operations (1964), and the Hsinankiang hydroelectric plant (1964).

This photograph, supplied by the Hsinhua News Agency, bears the following caption: "Led by Tsai Tsu-Chuan, the personnel of the Electroluminescence Source Laboratory at Fudan University, Shanghai, have succeeded in trial-producing a 200,000-watt long-arc xenon lamp. Tsai (center) is seen here installing an electrode into the lamp and sealing up the glass tube." In the accompanying article, A. Doak Barnett writes, "Mao in a basic sense has never really accepted the culture of modern science. . . . He has tended to look backward rather than forward."



In the current Cultural Revolution in China, Mao Tse-tung has challenged the imperatives of the scientific and technological revolution and has administered a significant setback to China's modernization process

A. Doak Barnett
Professor of Political Science
Columbia University

Mao versus Modernization

Though Americans' opportunities to study events in Communist China are severely limited, these events are of extraordinary interest from a number of different viewpoints.

China represents a massive experiment in political development. The Communists are attempting to apply totalitarian concepts of elite leadership, political control, and mass mobilization to the most populous country in the world.

It represents what in some respects is now a unique model of economic development. The Chinese Communists first borrowed very heavily from the Soviet, Stalinist model, but then in the late 1950's they introduced some new and very radical experiments in their Great Leap Forward and the Communes.

China also represents one of the most important examples of modern nationalist development. The Communists, like their Nationalist (Kuomintang) predecessors, are trying to create a new sense of national identity and a new political awareness in an ancient tradition-rooted society; they are determined to build the foundations of national power and prestige.

The development of science in China is intimately bound up in this unique social and political context, because science represents a central force in the basic processes of modernization now underway in that country as in most of the underdeveloped world. Political development, the growth of nationalism, and economic development are all aspects of the broader general process of modernization. But at the heart of the modernization process is something even more fundamental—the spread of new knowledge, ideas, patterns of thought, and values that are inherent in the scientific and technological revolution.

The absorption of these new ideas and values can involve very painful problems for traditional societies. And the trauma that China is now under-

going is related in a very fundamental fashion to unresolved dilemmas focusing on conflicts in values which arise out of the processes and consequences of modernization.

Utopianism vs. Pragmatism

During the past two years, while the so-called Cultural Revolution has been at its height in China, the Maoists have had a great deal to say about the conflict between the "reds" and the "experts"—that is, between the ideologues and political generalists, on the one hand, and the bureaucrats and technical specialists, on the other. While Mao asserts that both "hung," or "redness," and "chuan," or "expertness," are important, he insists that "redness" must be dominant in practice.

For students of the modernization process in China, these slogans are strangely reminiscent in many respects of slogans used by Confucian reformers in China in the Nineteenth Century. These reformers admitted that in the face of the impact of Western science and technology China had to change, to a degree, but they insisted that it also had to preserve its basic Confucian values and simply borrow techniques from the West. In the Chinese slogans of the Nineteenth Century, Western technology could provide "yung," or utilitarian practical learning, but Confucianism had to continue to provide "t'i"—the essential unchanging values of Chinese society and culture.

Mao would probably be outraged to hear himself, the foremost symbol of revolution in the world today, compared with Nineteenth Century Confucian leaders, but in a sense he is still struggling with the dilemma they faced. He is still trying to borrow selectively from Western science and technology while resisting many of the imperatives of scientific culture—and many of the consequences of the modernization process as it has unfolded elsewhere.

Though there is no universal agreement today on what the essential ingredients of the modernization

In promoting the Cultural Revolution and in enshrining as dogma his earlier revolutionary values, Mao has

set himself against the basic forces of modernization and the development of science and technology in China.

process are, there is a fairly wide consensus that modernization, and the scientific and technological revolution accompanying it, involve a steady growth of rationality, a tendency to emphasize secular values rather than dogma, an instrumental approach to change, and strong tendencies toward specialization, professionalization, and bureaucratic differentiation.

One of the most important of the many conflicts and dilemmas which underlie the power struggles and policy debates that dominate China today is the confrontation between the Maoists and non-Maoists concerning the basic values that should undergird the Chinese revolution and Chinese society in the years ahead. In oversimplified terms, it is a conflict between the dogmatic radical utopian and romantic ideas of the Maoists and the more pragmatic, instrumental values of those party, government, and military bureaucrats who oppose Mao.

Looking Backward, Not Forward

Mao is without doubt one of the most complex leaders of our era. He has been wholeheartedly in favor of change—drastic change—in Chinese society. He certainly accepts the “scientism” of so-called scientific Marxism-Leninism. And in many respects he can be regarded as a genuine modernizer, for in the two decades of Mao rule, significant processes of modernization have already occurred and have already had a very great impact on China.

The scientific establishment in China has been greatly expanded, and the educational system has been basically restructured to give much greater emphasis to scientific and engineering training. Despite the relative underemphasis on basic research, science and technology have been widely and fairly successfully applied to the problems of industrialization. In certain fields, especially those related to military affairs (such as the nuclear and missile fields), Chinese progress has been much faster than most outside observers would have thought possible. There has been a wide-

spread and quite imaginative effort to promote simple, inexpensive applications of new technology to problems of small-scale productive units, in agriculture as well as industry. Moreover, the regime has in many respects tried to alter basic attitudes towards change and to promote the concept of progress and the desirability of innovation.

But I would argue that despite all this, Mao in a basic sense has never really accepted the culture of modern science, and he has always been ambivalent about the consequences of modernization. In fact, as both he and the Chinese revolution have grown older he has become increasingly disturbed by the processes of modernization and by the effects of change now underway in China, and he has tended to look backward rather than forward.

The Issue: “Red” vs. “Expert”

In the early 1960's, after the failures of the Great Leap Forward and the Communes, Mao brooded over China's loss of revolutionary elan and came to blame it increasingly on China's pragmatically inclined bureaucrats, and the technicians, specialists, and professionals associated with them, who showed decreasing interest in Mao's ideologically inspired “grand solutions” to the nation's problems and an increasing tendency to adopt *ad hoc* instrumental approaches to problem solving, concentrating on immediate problems.

In one sense, the Cultural Revolution was Mao's answer; it was an attempt to return to ideological fundamentals, to revive the purity of earlier revolutionary values, to reindoctrinate the population in the dogmas of Mao's orthodoxy. The ideologically inspired political generalists, the “reds,” had to re-establish their dominance, in Mao's view, over the pragmatically inclined compromising bureaucrats and specialists. In the violent conflicts and power struggles of the Cultural Revolution, some of the basic issues have in some respects tended to be obscured, but the “red” versus “expert” issue is still fundamental and still unresolved.

New Directions for Management Information Systems

At first, the scientific elite in China, or at least those engaged in projects considered essential for national defense, appeared to be protected from much of the turmoil of the Cultural Revolution. But as the struggle has developed, it has become clear that the upheaval has been extremely costly in its impact on the entire modernization process. The educational system has been greatly affected—two years of higher education have almost been totally lost. Technicians and specialists have been bitterly attacked.

Even more important, the apotheosis of Mao's dogma, symbolized by the little red book of Mao's quotations, has created an atmosphere basically antithetical in many respects to the requirements of a genuinely modern scientific and technological culture. The recent cult of Mao seems, in fact, to be a throwback to China's past—a revival of the Chinese tradition of personalized leadership and ideological orthodoxy, with Mao as the sage in place of Confucius and Mao's selected works replacing the ancient classics.

Despite what I have said, Mao should not be regarded as totally irrational for what he has tried to do. He has had real cause to fear that the processes of modernization, as well as the re-emergence of traditional bureaucratic values, might undermine the revolutionary values which he has promoted. Moreover, the problem of political generalists versus technical specialists was real, and is real, and is by no means unique to China. One can also understand why Mao might have concluded that in a society as large and complex as China, which traditionally had been held together by ideological orthodoxy, total acceptance of his new orthodoxy was essential for unity.

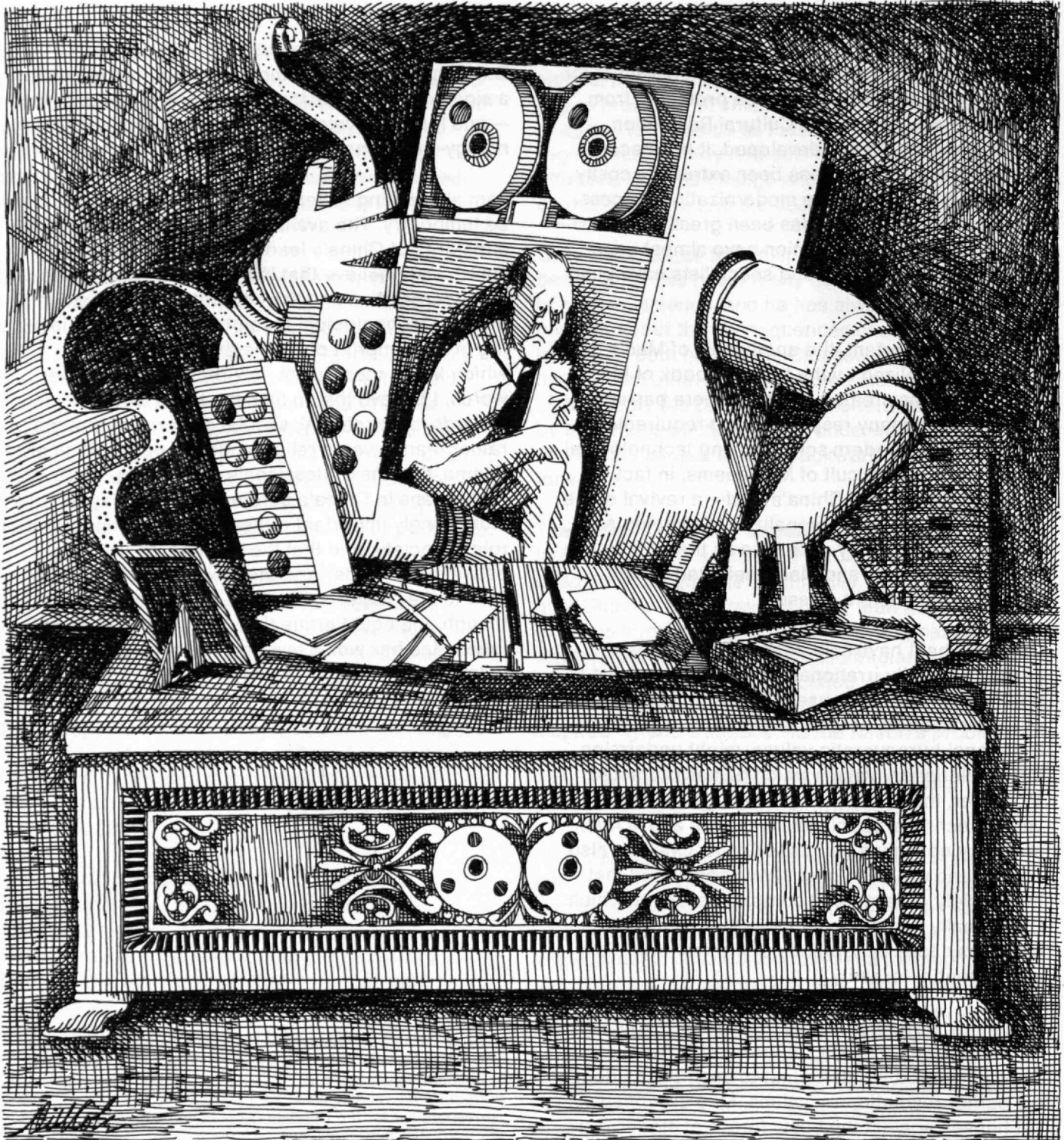
But, in my view, in pressing for the clear dominance of "reds" over "experts," in promoting the Cultural Revolution, and in attempting to enshrine as dogma his earlier revolutionary values, Mao essentially set himself against the basic forces of modernization in China in an unrealistic and utopian fashion.

No one can predict the outcome with certainty. But, in my view, the Cultural Revolution represents a significant setback for the modernization process—and for the development of science and technology—in China.

I am also willing to venture that the setback will be temporary. The available evidence suggests that a majority of China's leaders have opposed Mao's views, and I believe that in the end the processes of modernization and the imperatives of the scientific and technological revolution will be more lasting in their imprint on China than the dogmas which Mao's utopianism now represents. In other words, I believe that in time the trend will be towards more rational, secular patterns of thought rather than towards reliance simply on ideological dogma, that the professionals, specialists, and technicians in China's bureaucracy will play an increasingly important rather than a less important role in society, and that the balance, over time, between the "reds" and the "experts" will steadily shift to the "experts." In short, I believe that, even though one could argue that in the Cultural Revolution Mao has won a few battles, he is destined to lose the war.

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"The real purpose of management information systems is to draw managers out of their degenerative cycle by relieving them of repetitive decision-making tasks that can be successfully performed within the system itself . . . Some people will be troubled by this argument because to them it implies the manipulation of human beings by inanimate computerized systems and because it suggests that management information systems can possess intelligence . . ."



New Directions for Management Information Systems

Management information systems have two major purposes:

1. To facilitate managerial planning and control—that is, to help management plan better and to control the operations which are necessary to implement the plans.
2. To relieve management of all repetitive tasks so that the managers may concentrate on planning.

In the context used here, planning is viewed as the process by means of which managers choose appropriate objectives and the means for their implementation. It includes the transformation of objectives into meaningful subobjectives and the design of the information system which is necessary for control purposes. Planning sets the structure within which operations take place. It orders the environment, fixes resources, and prejudices operations for years to come. Obviously, the greater the resolution and detail of planning introduced by high levels in the management hierarchy, the lower are the requirements for value-judgments in low-level managerial decisions and the more restrictive is the environment within which low-level managers operate. Management control, on the other hand, is enhanced by such resolution.

Planning *in its totality* is a dynamic, nonrepetitive and time-interdependent process. It is distinguished from policy, a static notion which refers to planning for repetitive environmental situations, a procedure which tells us what to do whenever we meet a certain predicted situation.

Control is the process which singles out critical dimensions, applies measurements and generates signals to show how well operations are conforming to the postulated plans. It is an integral part of the total planning process, mostly part of a closed-loop system where the control unit is embedded in the process which it attempts to control. Managerial control systems must be capable of performing diagnoses and—more important—

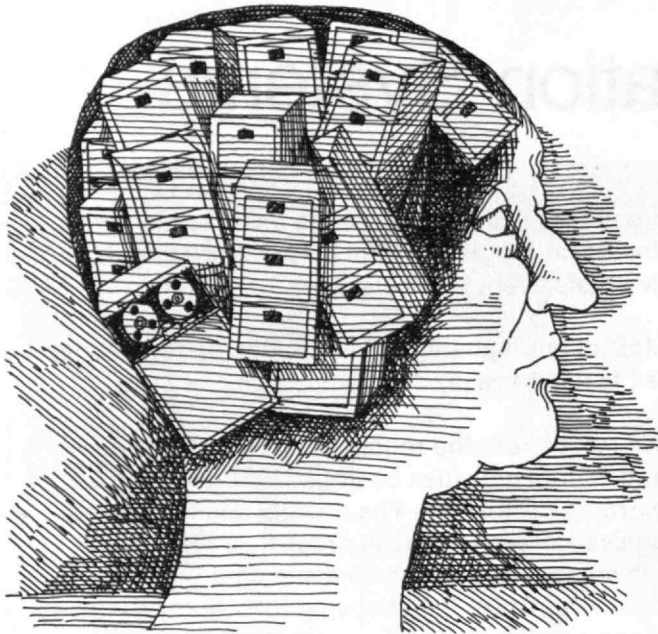
prognoses in such a way as to give the planner time to correct the system before a predicted undesirable event takes place.

Most of our managerial information systems today fail to fulfill this predictive function.

We must stress the requirement that planning and control activities be linked recursively in a hierarchical fashion. The first need is to develop an over-all plan. Then, in order to implement it, top management must set some control parameters. These then become (or influence) the planning variables of lower levels. Finally, the result of the control process may involve replanning and resetting of the control parameters. It is in this manner that signals chosen by high management levels become goals of lower levels.

No one, I trust, will take issue with the first assumption that the role of management information systems is to facilitate planning and control. But there will be many who will feel uncomfortable with some of the consequences of the second objective—to take over from management all the repetitive and programmable aspects of planning and control and allow management by exception. This second assumption postulates that the system will be used as an extension to human capacity and intelligence, as a stepping-stone to higher level planning and control.

Present information systems have the capability to store data (as long as unused storage capacity exists), classify them on the basis of some pre-stored rules and extract differences (variances). The latter indicate the potential existence of problems. In order to serve as extensions of human intelligence, however, information systems must be able to store cause-and-effect relationships, and ultimately to recognize patterns of relationships on the basis of incomplete information—that is, to recognize the total picture before all the pieces of the mosaic fall into place.



Some people will be troubled by this argument because to them it implies the manipulation of human beings by inanimate computerized systems and because it suggests that management information systems can possess intelligence. These fears are exaggerated: I hope to show convincingly that a system's intelligence cannot endanger human beings; it can only provide us with more powerful tools.

Assumptions Concerning Human Nature

Human beings have certain characteristics of intelligence which we must understand and, where necessary, imitate if we are to design efficient information systems for planning and control. Since the information generated by the managerial system is to motivate managers to learn and perform better, we have to know how people perceive information, how they are motivated on the basis of such perception, how they associate cause and effect, and how they react to such associations. We do not want symptomatic reactions and symptom cures; we want fundamental causal diagnoses.

Four assumptions concerning human nature are important to us:

1. In our brain, feasible storage capacity is so scarce that we must be selective in what information we store and in how we store it. The more

space we use for storing raw data, the less we can use for contextual associations. The latter give us the advantage of a retrieval system by which stored information can be *meaningfully* recalled because it is related to some context or pattern of experience.

2. People are not completely rational with respect to every objective, because the objective itself is not universally held; but note that information systems help increase rationality by providing signals which motivate people to associate cause and effect and discourage them from unconsciously substituting individual goals for the organizational objectives.

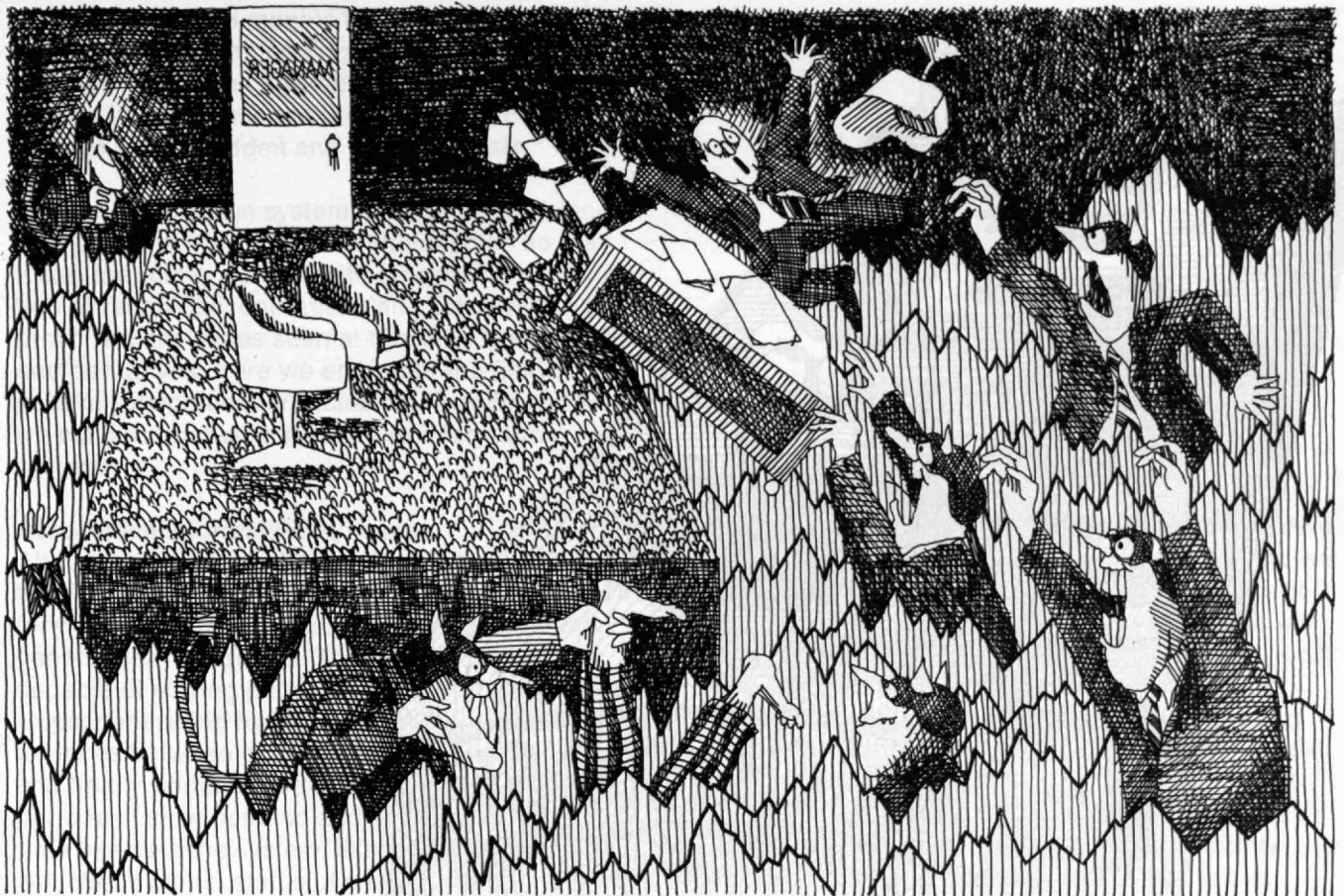
3. One of the most critical assumptions about humans is that by nature people try to classify, organize and create structures for storing information. In order to solve problems we have to develop procedures by which we can recognize the existence of problems, compartmentalize them, associate parts of them with other known similar situations, develop plans for solution and finally fit the parts into the total.

4. People by nature prefer to stay within an ordered environment rather than to venture into the unknown.

There is an important conflict between the last two of these assumptions. The desire of human beings to order and structure their environment is conducive to progress and learning, but the aversion toward uncertainty inhibits creativity. That is perhaps why the greatest revolutionaries often turn into the greatest conservatives, and as a result the revolutionary process stops. If we could somehow continuously thrust an individual into an unstructured environment, we could capitalize fully upon his great innate capabilities to create order out of chaos and therefore to advance learning. To achieve this end the system must continuously motivate him to venture into a new state of uncertainty, for his natural tendency will be to stagnate, regimented by the very structure he himself creates.

This implies that we need control to order the unstructured situation. But we must also recognize that control has a tendency to regiment—it may become an end in itself.

It is also clear from this discussion that the average individual, unless consciously directed, will attend to the short-range problems that are put before him and neglect the long-range aspects of planning and control. This is because long-range planning involves estimation and forecasting, an excursion into the unknown which makes many people un-



comfortable. This process is degenerative: the more a person devotes himself to emergency short-range problems, the less time he has to spend on planning, and the less time he spends on planning the more the emergencies to which he must devote his energies.

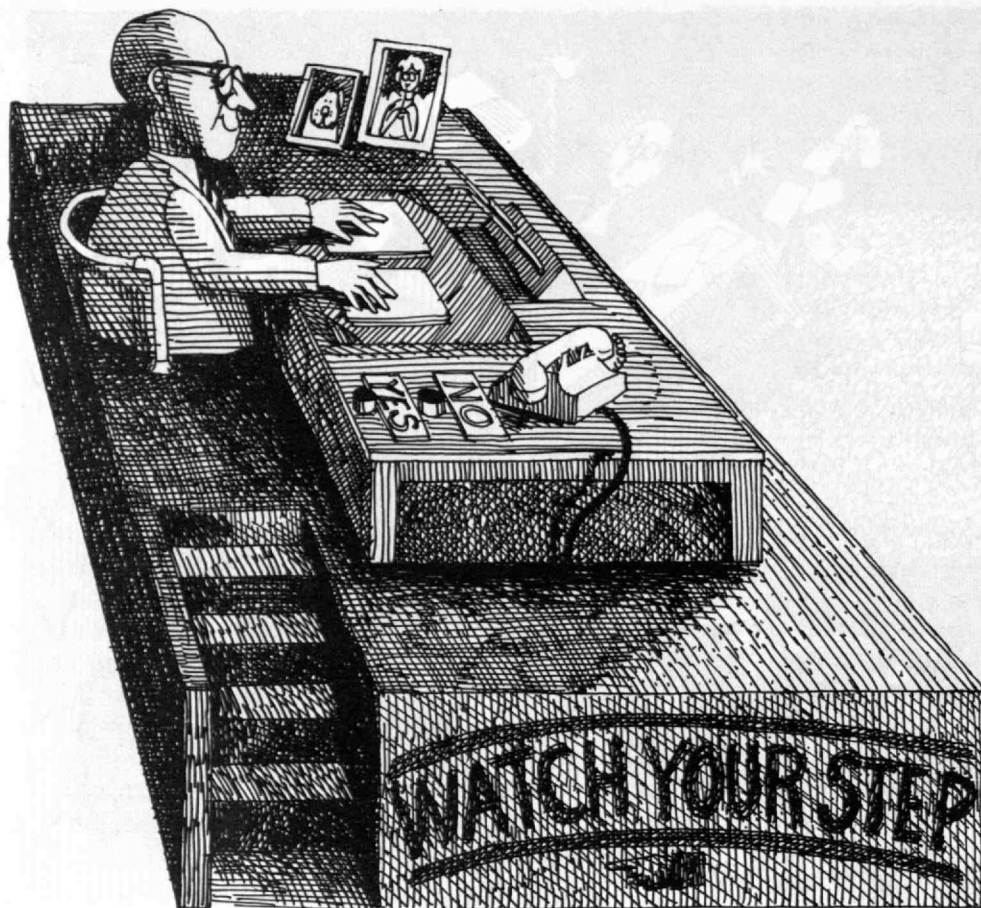
The real purpose of management information systems is to draw managers out of this degenerative cycle by relieving them of repetitive decision-making tasks that can be successfully performed within the system itself. The system monitors and controls operations on the basis of specified plans, provides managers with the results of the control process on a selective basis, lets management make decisions for which no routine has been provided, and gives managers time for more formalized planning so that management can eventually develop an inventory of planning knowledge.

Where Do We Start?

Where do we start in this process of developing intelligent information systems? There are some good characteristics of some existing systems on which we can capitalize. For example, existing standard systems with flexible budgets enforce estimation and formalization of models. They can be closed-loop systems, and they can be applied to other than manufacturing operations.

The first thing that we can do to improve a standard cost system is to enable the system itself to assess the significance of the observed differences instead of dropping everything into the laps of managers. Today's typical accounting system forces the manager to scan and question the significance of literally thousands of entries. He is often hopelessly lost because he cannot determine what is important and what is not; his time is limited, and often in the end he may solve his problem by ignoring data and deciding on intuition. This process has some very grave consequences: resources are expended on information gathering and processing for a very limited purpose, managers are often forced to conduct time-consuming postmortems, and production resources are likely to be wasted. We must help the manager utilize his time more effectively. We can do this by asking him what rules he applies in determining what is significant and what is not, introducing such information into the system, and from then on letting the system do the first sifting and report only the significant variations.

A system such as this which can operate on sampled information will be both better and less expensive. In the few cases that I have studied only about 1 per cent of the data presently transmitted to managers is important enough to merit their attention. With this burden of insignificant detail



removed, the manager will be able to concentrate on the few questions that need his attention. He will also be encouraged to plan a structure to deal with some remaining situations that now require his attention, derive cause and effect relationships and learn how to perform better by generalizing about questions within the same class of problems.

The techniques for implementing a simple probabilistic system exist today. A lot of work on managerial models is already behind us, and we need only to formalize and institutionalize these models by introducing them into the continuous information system of the firm. Once this is done, control limits similar to those imposed by quality control engineers can be applied in order to determine what information is significant, and on the basis of this result perform an analysis of the few significant variations in order to find cause-and-effect relationships. These may then be introduced into the information system for subsequent validation.

Modern statistical techniques allow us to marry intuition with objective observations and sequentially apply the cumulative experience of the information system for validation of the models that we use. This contrasts significantly with present accounting systems which close out the variances, look at periodic results in isolation, and in the

process destroy the statistical universe from which can be derived inferences about the underlying cause-and-effect relationships.

Generalizations from Significant Variations

As you can see, I am suggesting a continuous upgrading process. But we need not stop here. We can also question whether we can generalize on the basis of these cause-and effect relationships to help subunits reconcile their interdependencies within an existing organization. Because of the human tendency toward regimentation and stagnation, we must try to provide as part of the regular information process routine signals on the possible advisability of an organizational restructuring. This aspect of the system focuses on covariances—that is, it analyzes how the performance of subentities varies with causes originating elsewhere within the organization. Among the components of such covariances are the statistical and accounting variances generated by the system as part of the routine operational control. So for the first time we can now obtain signals on possible reorganizations as part of our regular information flows. The analysis of covariances to determine cause-effect relationships will help tremendously in formalizing models, facilitating planning, and giving prognostic signals to interrelated subunits. For example, once the system picks up a significant variation in subunit X which will have an impact on

subunit Y, say two months hence, then subunit Y is warned of the impending consequences. The manager of subunit Y in this way has two months to plan in anticipation of the impact; he does not have to face a sudden and wasteful crisis.

Will the information system itself eventually recognize patterns of meaningful relationships so that it can associate a signal with an existing configuration of resources, operations and plans within the firm? The answer as seen at this time is a guardful and partial yes. Here we enter into the field of pattern recognition, artificial intelligence and what we call associative and adaptive information systems.

Associative Information Systems

Although technology is not as yet fully developed to allow associative and adaptive managerial information systems, we can foresee some of their general characteristics. These systems must be capable of storing patterns of dominant relationships, generating hypotheses on the basis of differences between expected and observed patterns, and finally updating the stored patterns. During periods of slow demand and at other pre-assigned time intervals the system, like a roving inspector, will check on the status of environmental assumptions, plans and resources. As soon as it observes critical deviations in any one of the important relationships, it will analyze the consequences according to prestored arrangements and report to the appropriate manager for decision. Let us take, for example, the case where the system during a check determines that there is unexpected slack in a valuable resource. It will automatically look to determine the ancillary resources which prejudice the efficiency of the surplus resource and then check on their operating status. If it is determined that certain assets are constraining the use of the surplus resource, then the expected value of removing such a constraint will be calculated and presented to the manager who will decide if it is worth the expected cost. Furthermore, the system will check to find out what will be the expected value and cost if the surplus resource were used for its secondary purposes (according to alternative plans). Based on the same principles, signals can be generated to report major deviations from the preferred plan both in terms of objectives and operations and resources necessary to carry them out.

A system such as this will, first of all, allow us to be dealing mainly with opportunity values—that is to say, values derived from the best alternative use of critical resources—rather than purchase cost. Also, the system will be sequentially improving the planning models and helping managers plan better.

Computers obviously must be used for these endeavors. Compared with human beings, computers are persistent, consistent, rational and fast, and we need to exploit these capabilities to complement human associative powers. Because of this, it will be important for managers to learn to live and work with computers. From many corners we hear of fears that these new systems will risk increasing passivity, submissiveness and anonymity throughout the firm. This, of course, need not be so, but there is a real danger that the firm may become dependent upon a system which tries to justify the very expensive tool that makes it possible. The only way to guarantee that the system will effectively serve managers as an extension of their intelligence in planning and control activities is to insist that managers influence its design. This is a very serious matter, and it cannot be left to the systems engineer without painful consequences.

So it is that some computerized systems remind managers of that little girl in children's nursery rhymes: "When she was good she was very, very good. But when she was bad, she was horrid."

Zenon S. Zannetos, Ph.D. '59, is now M.I.T. Professor of Management; his primary fields of interest are economics of the firm and management information and controls, and he has made economic analyses of such specialized subjects as oil tankship operation and corporate divisional structures. He has been associated with the Sloan School of Management since 1955. The illustrations are by Dill Cole of Eucalyptus Tree Studio Inc.

"... we have decided to call the entire field of control and communication theory, whether in the machine or in the animal, by the name Cybernetics, which we form from the Greek term (for) steersman..." So wrote the late Norbert Wiener, Professor of Mathematics at M.I.T., just twenty years ago in his introduction to the book of the same name, of which a page of the manuscript is reproduced here. It was Dr. John S. Barlow's privilege to participate in some of the research which pre-dated this publication and in many of the events which followed it. (Photo courtesy the M.I.T. Press from the M.I.T. Archives)

about Dr. Rosenbluth and myself had already become aware of the essential unity of the group of problems centering about communication, control, and statistical mechanics, whether in the machine or in living tissue. On the other hand, we were seriously hampered by the lack of unity of the literature concerning these problems, and by the absence of any common terminology, or even of a single name for the field. After much consideration, we have come to the conclusion that all the existing terminology has too heavy a bias to one side or another to serve the future development of the field as well as it should, and as so often in science, we have been forced to coin an artificial neo-Greek expression to fill the gap. We have decided to call the entire field of control and communication theory, whether in the machine or in the animal, by the name Cybernetics, which we form from the Greek term κυβερνήτης, or steersman. In choosing this term, we wish to recognize that the first significant paper on feed-back mechanisms is an article on governors, which was published by Clerk Maxwell in 1868, and that governor is derived from a Latin

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corruption of κυβερνήτης. We also wish to refer to the fact that the steering engines of a ship are in

On the 20th anniversary of its publication, a member of the Boston scientific community recalls the events leading to *Cybernetics* as an example of the fruitful interaction of scientists and their institutions

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Cybernetics, Technology, and the Humanities: A View from the Threshold

It is now just 20 years since the first publication of Norbert Wiener's *Cybernetics or Control and Communication in the Animal and the Machine*. At the present time, as M.I.T. moves increasingly into interrelationships with other institutions in the Greater Boston area, Wiener's *Cybernetics* serves to remind one again of the fact that every educational institution should be a center whose members interact with academic and professional workers elsewhere.

In the Introduction to the book, Wiener remarked that the work represented the outcome of a program of research with Dr. Arturo Rosenbluth, a biologist who was initially at Harvard Medical School and later at the National Cardiological Institute in Mexico City. And M.I.T.'s own role in the exploration of some of the biological implications of Wiener's ideas as expressed in his *Cybernetics*, as well as in his *Extrapolation, Interpolation and Smoothing of Stationary Time Series*, and the more recent *Nonlinear Problems in Random Theory*, can also be considered illustrative of this kind of mutually advantageous interchange between members of various academic communities. I have had the good fortune to have participated in some of this work, in which Dr. Wiener himself had an abiding interest, and I have thus had the opportunity to be intimately associated with M.I.T. But beyond that, I have also sampled, in some ways that are perhaps unique, other aspects of the larger university atmosphere that M.I.T. has increasingly come to represent.

The influence of M.I.T. makes itself felt in many ways, and the more direct contacts which I have had with the Institute since arriving in Boston in 1951 were in a sense logical developments of earlier events. The first of these was attendance at the M.I.T. Radar School in 1945, while I was in military service. Then, in 1949, when I had just started medical school at the University of North Carolina, Dr. Lytt Gardner, who knew of my previous exposures in physics and electrical engineering, thought I might be interested in looking

through a book he had recently obtained, Wiener's *Cybernetics*. It was particularly Dr. Wiener's comparative discussion of pathological tremors in man and the possible malfunctions in feedback systems that can give rise to undesirable oscillations which attracted my interest, for I was quite familiar with the latter from the M.I.T. Radar School, as manifested by the servomechanisms used for controlling the position of radar antennae. It was just at this time that the extraordinary beauty of the anatomy and physiology of the nervous system were becoming apparent to me, through the relevant parts of the medical school curriculum.

Somewhat later the Quarterly Progress Reports of the M.I.T. Research Laboratory of Electronics as well as Yuk Wing Lee's [27] Technical Report on "Applications of Statistical Methods to Communication Problems" came to my attention, in the course of some theoretical work at the Institute of Cooperative Research of the Johns Hopkins University in Baltimore on the propagation over great distances of the electromagnetic discharge from lightning strokes.

Toward "Neurological Cybernetics"

It is not surprising, then, that shortly after I arrived in Boston in the fall of 1951 to complete the third and fourth years of medical school at Harvard, I began to make inquiries about "neurological cybernetics." As a result, I fairly soon found my way to Dr. Mary A. B. Brazier at the Massachusetts General Hospital, who with Dr. James U. Casby, '52, and with the strong interest and encouragement of Wiener, had already begun to explore the human electroencephalogram as a time series in the Wiener sense. Their tools were those of autocorrelation and crosscorrelation, as developed for example in Wiener's *Extrapolation, Interpolation and Smoothing of Stationary Time Series*. Dr. Brazier and Dr. Casby recorded the EEG at the Massachusetts General Hospital on a magnetic tape recorder that had been especially designed for the purpose at the Research Laboratory of Electronics by Paul E. Green, Jr., Sc. D. '53 (whom I

had known from undergraduate days in physics at the University of North Carolina), the recordings being processed on the digital correlator in R.L.E.

However, there existed at that time no correlator that was especially designed for EEG work; the decision to construct such an instrument was taken at a meeting in the spring of 1952 at which Dr. Brazier, Walter A. Rosenblith, Professor of Communications Biophysics at M.I.T., E. Colin Cherry, Professor at the Imperial College of Science and Technology in London, and I were present. The correlator (the construction of which at R.L.E. was only one indication of the broad view of the Laboratory's charge that was envisaged by Jerome B. Wiesner, its Director at the time) was to be modeled in part after the one that had been recently developed at the Imperial College for analyzing speech waveforms and would utilize a magnetic delay drum of the type Kenneth Goff, Sc.D.'54, had then recently designed in the Acoustics Laboratory at M.I.T. I began the electronic redesign work for the correlator in the summer of 1952, to be joined later by Robert R. Brown, Jr., E.E.'59, who had then joined Professor Rosenblith's Communications Biophysics Group in R.L.E.; and the correlator was completed in time for demonstration for the Second International EEG Congress which met in Cambridge in August, 1953. At the Congress, Dr. Wiener discussed some of the correlograms of EEGs that had already been obtained with the instrument.

Wiener continued to maintain rather close contact with this co-operative endeavor—contacts that were enriched for me personally by a series of tutorials with him on prediction theory. (The contents of the tutorials, on which I took extensive notes and listened religiously but with less than complete understanding, provided a striking contrast to the part of the medical school curriculum at Harvard with which I was then occupied—namely, obstetrics at the Boston Lying-In Hospital.) I gained further familiarity with statistical communication theory not only from Dr. Wiener's book on *Time Series* but also from writings of other members of the M.I.T. com-



munity such as Professors Wiesner, Thomas P. Cheatham, Jr., Sc.D.'52, and Lee, and I audited portions of Professor Lee's course in the subject.

It was partly as a result of the discussions in this group of the detection of weak radar echoes by crosscorrelation of the radar returns with the transmitter pulses that I began to explore the analogous problem of detecting in the EEG the electrical responses evoked by sensory stimulation. These explorations were initially carried out with the analog correlator designed by J. Francis Reintjes at R.L.E.; somewhat later I constructed an appropriate circuit so that our correlator system for brain potentials could also be used for this purpose.

Spin-offs in Instrumentation

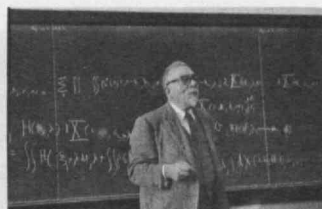
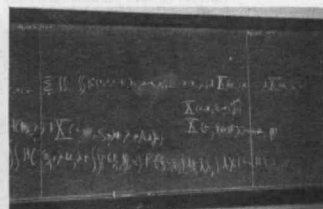
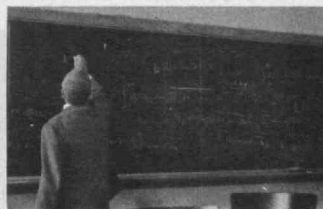
This free and ready interchange between our Neurophysiology Laboratory of the Neurology Service at the Massachusetts General Hospital and the Communications Biophysics Laboratory of R.L.E. at M.I.T., which I continued after Dr. Brazier's departure from M.G.H. in 1961 to join the Brain Research Institute at the University of California (Los Angeles), has permitted the exploration over the years of a number of different problems in both normal and abnormal function of the nervous system. Initially concerned with the study of the EEG itself and the effects on it of sensory stimulation, these techniques from communications engineering that had as their basis Dr. Wiener's mathematical concepts of correlation analysis have also proved to be of great value in the study of other phenomena related to the nervous system such as eye movements, normal and pathological tremors and other movement disorders in man.

These photographs represent a unique record of a remarkable achievement. They were made by Yuk-Wing Lee, '27, Professor of Electrical Engineering at M.I.T., while the late Norbert Wiener, Professor of Mathematics, delivered a series of lectures for graduate students in 1958. The primary purpose was to record Professor Wiener's development of mathematical expressions which later appeared in his monograph *Non-Linear Problems in Random Theory*, published by the M.I.T. Press.

an important aspect of the problem (in the M.I.T. Science Library and in the Document Room of the Laboratory for Nuclear Science) by fruitful discussions with several members of the M.I.T. Cosmic-Ray group.

Language Study and its Derivatives

Finally, the influence of M.I.T. took form a major



So that the approach to clinical problems with the aid of these techniques could be made the more intelligently, Dr. Raymond Adams, Chief of the Neurology Service at M.G.H., had at an early stage very wisely advised me to have some post-graduate clinical training in neurology; this objective was achieved by means of a clinical and research fellowship in neurology at M.G.H. in such a way that the continuity of our ongoing research program was essentially maintained. Since then, the strong clinical neurological service at M.G.H. and its active clinical EEG Laboratory (under the direction of Dr. Robert Schwab) have provided a proper perspective from which studies in clinical neurophysiology could be carried out, and they have provided the very initiating spark for several of them.

In the course of this work, there have continued to be "spin-offs" in the field of instrumentation which have resulted in part from the early electronic developmental work that I carried out at R.L.E. In recent years this activity has been primarily at M.G.H., where our Neurophysiology Laboratory of the Neurology Service, in addition to its primary work in basic and clinical neurophysiology, has in some sense become a sort of R.L.E. in miniature and where the influence of R.L.E. is still very much present. For example, some elements of our very recently developed automatic EEG inked-trace reader have as their origin the circuit for averaging EEG responses evoked by sensory stimulation which I added to the correlator system for brain potentials almost 15 years ago. (The original correlator system for brain potentials itself now rests in semi-retirement in this laboratory at M.G.H., supplanted in part

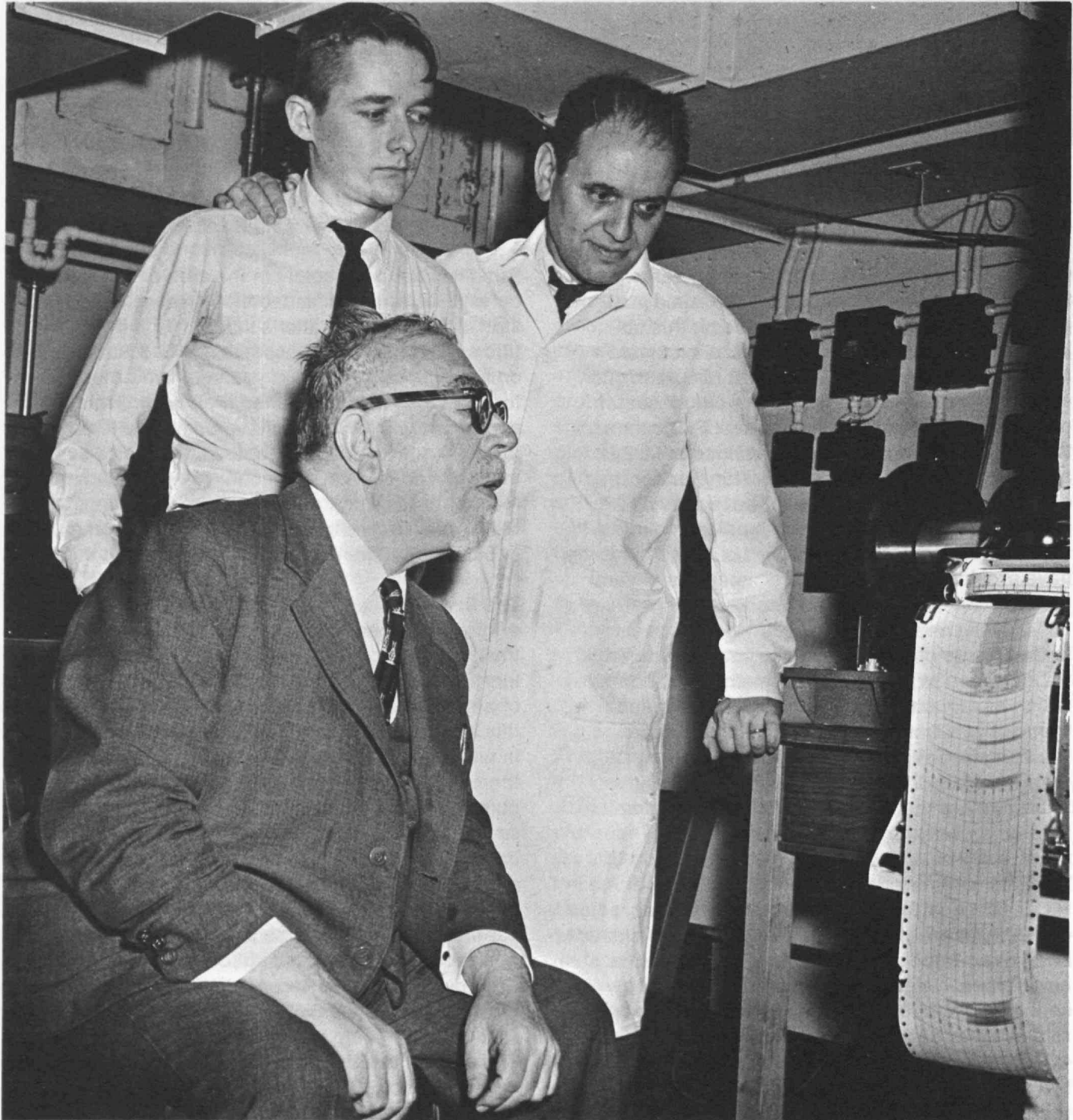
—but not completely—by advances in technology that have in part come from R.L.E.)

But it has not been solely in the area of the biological and instrumental aspects of cybernetics and statistical communications that M.I.T. in its scientific and technological aspects has had an impact on my own work in recent years. In two other areas, for questions that in part had their origin from my earlier years in physics, I have been able to approach knowledgeable people at M.I.T. as a supplement to a considerable amount of exploration of the literature (much of it to be found in the various M.I.T. libraries) as a background for preparing papers for publication.

The first of those explorations in fact had its origin in the news release some 10 years ago from the M.I.T. Instrumentation Laboratory concerning inertial navigation, reporting the automatic control of an airplane flying from Boston to Los Angeles by this means. The news release immediately raised in my mind the question of whether animals, in their ability to navigate (particularly under circumstances when the ordinary sensory cues seemed to have no role), might also in part utilize inertial navigation. For the engineering aspects of this question, the publications on inertial navigation and inertial guidance from the Instrumentation Laboratory were of course of considerable importance; so were other publications in the M.I.T. Engineering and the Aeronautics and Astronautics Libraries and in the Document Room of R.L.E.

The second venture, in rather a different field, resulted from my encountering the fact that the prevalence of certain diseases appeared to exhibit

This historic photograph shows the late Norbert Wiener, Professor of Mathematics, studying the record of his brain waves emerging from an auto-correlator developed in the Research Laboratory of Electronics and Massachusetts General Hospital by the author, John S. Barlow, and Walter A. Rosenblith, now Professor of Communications Biophysics at M.I.T.



some systematic variation with latitude. The question occurred to me of whether the variation might be with geomagnetic rather than with geographic latitude and therefore be related in some way to cosmic ray phenomena. Once again, in preparation for raising the question more formally in publications, I was able to supplement reading on the physical aspects of the problem (in the M.I.T. Science Library and in the Document Room of the Laboratory for Nuclear Science) by useful discussions with several members of the M.I.T. cosmic-ray group.

Language Study and Its Derivatives

Finally, the influence of M.I.T. has been a major one in the area of language study, in which I have developed something more than a passing interest in the last 10 years. This activity began at the Institute when I audited two years of Russian, as a follow-up to participation in a course in Russian that had been conducted at M.G.H. Then, in successive years, I audited Professor William F. Bottiglia's seminar in Dante's *Divine Comedy* (with its very useful preliminary, a survey of Italian grammar) and the second term of an evening course in Spanish that was taught by Gustavo A. Alfaro (which I hurriedly joined, having learned of a forthcoming trip to Mexico).

These studies in languages have invariably had the dividend that they have opened up successively wider vistas of the scientific literature, most of which would otherwise have remained largely closed to me; in the case of Russian, the publication of a translation I prepared of a conference monograph on mathematical analysis of EEG has been another result.

Even for more recent study of languages which I have not formally undertaken at M.I.T., its libraries have, once again, been an invaluable resource. Thus the collection of Mainland Chinese science materials at the Science Library (which had been sponsored by the National Science Foundation) has provided one source for papers of which I have subsequently made translations and of which one from the M.I.T. collection has now been published. (Prior to this somewhat formidable undertaking, I had audited the equivalent of three years of Chinese at Harvard.) In preparing the translations themselves, certain Chinese dictionaries at M.I.T. (including a particularly useful Chinese-Russian one) were immensely helpful to supplement my own collection, and by arrangement with the Office of the Director of Libraries, I was able to secure an extended loan of a duplicate set of one of the dictionaries before obtaining my own copy. More recently, a Czech-Russian dictionary in the Library was occasionally a valuable aid in translating from the Czech a little monograph

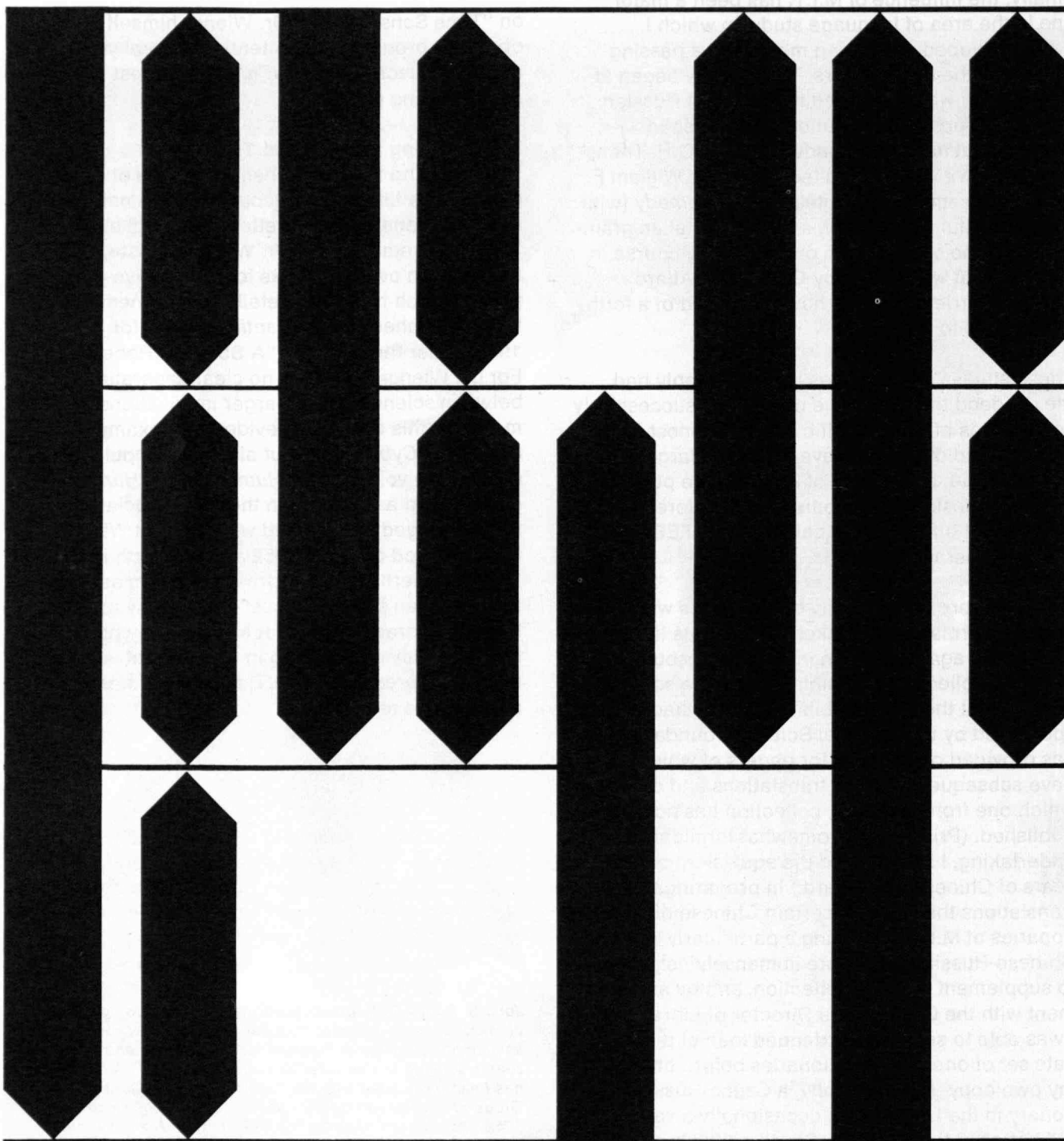
on "Time Sense" which Dr. Wiener himself had originally brought to my attention several years ago in connection with our mutual interest in this still intriguing problem.

Transcending Science and Technology

In concluding this essay, I am reminded of the fact that the first time I encountered the name Norbert Wiener was in a letter from a colleague in 1948, who remarked on Dr. Wiener's postwar refusal to turn over his works for destructive purposes (which had been detailed in his memorable letter published in the *Atlantic Monthly* for January, 1947, under the heading, "A Scientist Rebels"). For Dr. Wiener there was no clear separation between science and its larger implications for mankind; this concern is evident, for example, not only in his *Cybernetics* but also in its popular companion volume, *The Human Use of Human Beings*. And as I reflect on the rich associations I was privileged to have had with Norbert Wiener in that period between 1952 and his death in 1964, it is perhaps the impression of him as a humanitarian that rests most firmly in my mind. But in this area his voice at M.I.T. has by no means been the only one. And so in this respect, also, my own impression of M.I.T. is one that transcends science and technology.

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This flow model suggests the nature of interaction between levels of municipal administration and those it serves. It includes directives sent from above, "requests" from below, and feedback through levels of administration. The chart is included to demonstrate the complex interrelations with which the techniques of systems analysis must deal when applied to problems in municipal management.



The complexities of managing the modern urban environment can yield to a synthesis which is beyond man's scope but within the power of his genius through computers

Arnold E. Amstutz, '58
Associate Professor of Management, M.I.T.

City Management— A Problem in Systems Analysis

"What must we do between now and the year 2000 to make the city responsive to man's needs?"

Implicit in this question, posed by representatives of every facet of American life today, is the assumption that cities can be made to respond to man—that man is capable of molding the facilities, institutions, and human processes that together constitute a modern metropolis.

Are these reasonable assumptions? Can man control the evolution of a major metropolitan area? Indeed, is man capable of comprehending and relating the myriad elements and subtle interactions that cause a city to grow, to prosper, and to serve the needs of its residents? Or are we no longer capable of understanding or regulating our environment, destined to see our cities careening out of control toward destruction?

The city may be among the most formidably complex interactive systems that man can attempt to manage. Clearly its growth and development represent an unstable dynamic process which contains the potential for self-destruction. And clearly the problems will not become less complex. Members of the Commission on the Year 2000 of the American Academy of Arts and Sciences predicted the expansion of currently existing metropolitan areas so that between 80 and 90 per cent of the population of the developed world will be urbanized by the end of the century.

If these megalopolises are not to decay as rapidly as they expand, we must develop new approaches to the management of the city. It is no longer realistic to append suburbs to cities, extensions to thruways, or advisory boards to municipal governments, and expect these actions to produce more effective response to man's needs. Rather, we must develop new and relevant decision frameworks and organization structures appropriate for the control of the increasingly complex interactive social, economic, and political systems.

In 1966 the Mayor's Task Force on the Reorganiza-

tion of New York City Government presented a proposal, since implemented, to restructure the functional organization of America's largest city. In the introduction to this report the Task Force stated, "If a modern city is to be governable it must possess three crucial assets: (1) the will to act; (2) the necessary human and monetary resources; and (3) the administrative machinery to bring the first two assets to bear on its problems. The increasing complexity of modern urban problems calls for more imaginative and creative development of policies, and this in turn requires more sophisticated tools of government to formulate and execute these policies in a co-ordinated, effective manner."

Managing Complexity Through Systems Analysis

Certainly a concerned populace has the will to act, and the resources of our larger cities are vast. But what kind of administrative machinery is required? What are the "sophisticated tools" which men might use to structure and solve the complex problems of a city?

One of them, cited in the January, 1968, issue of *Fortune*, is systems engineering, which "would examine the city in the round as a total systems complex, interrelating all its demographic, economic, social, and physical components, with a view to arriving at more integrated solutions to the multiple problems."

What is Systems Analysis?

The concept of analysis is well understood. We use the word analysis to refer to the process by which a problem or entity is separated into constituent parts—literally unloosened or resolved into elements. Systems analysis might, therefore, be defined as the examination of systems to distinguish their component parts and elements separately or in relation to the whole.

The real question, then, is, "What is a system?" The yearbook for the advancement of general systems theory provides the following definition:

resentation of the city. The process challenges the executive to describe the environment he is attempting to influence. This perspective should be emphasized. Systems analysis focuses on the environment to be influenced through decisions, not the decisions themselves.

Abstraction is inherent in systems analysis. The individual who develops a model must impose structure on a situation. He must specify that which is relevant. This requirement is not unique to systems analysis. Whether or not a decision maker develops an explicit model, the information considered in reaching a decision is determined by his limited perception of the decision environment. Subjective evaluation is present whether or not an explicit model is established. However, as a representation is made explicit, the level of abstraction—the level to which the model builder has reduced the situation to a limited and manageable number of factors—becomes more obvious.

The perceptiveness of the individual who has the ability to "separate the wheat from the chaff" and "get to the nub of the problem" is often lauded. Yet, when this same perception is applied to the structuring of an explicit decision model through exclusion of other than the most relevant factors, the results may appear appallingly "simple-minded" and be dismissed as "naive" or "sophomoric." It is not surprising to find that human reactions present more significant barriers to successful systems analysis than any technical consideration that can be identified. The systems analyst must assume one of the most influential, yet ill-defined, roles in the management structure. He is an agent of change, a troublemaker for the establishment, a creator of dissent.

The City as a System

If the city is to be viewed as a system we must establish a conceptual framework, a skeletal structure to which the elements relevant to city management may be attached. This conceptual framework must:

1. Define a set of elements that, while common to a broad range of management problems, are defined in sufficient detail to permit differentiation between relevant states of the environment.
2. Serve as a basis for description of processes as well as of elements—provide a means of describing interactions between elements.
3. Be based on measurable entities amenable to quantitative description and validation.

A city can be described in many diverse ways and depicted in conflicting word pictures. One can, for example, consider the organization structure of a municipality, and this was the focus of the re-

"A system is a set of objects together with relationships between the objects and between their attributes." Another source indicates that "a system is an organized or complex whole: an assemblage or combination of things or parts forming a complex or unitary whole." The word system can thus connote a plan, method, structure, framework, sequence or organization.

These definitions suggest that the application of systems analysis to the problem of the city will involve an examination of the elements and relationships which make up the "city system." The systems analyst proposes to approach the complexities of the city by structuring existing knowledge and assumptions in a series of assertions that may be verified through testing.

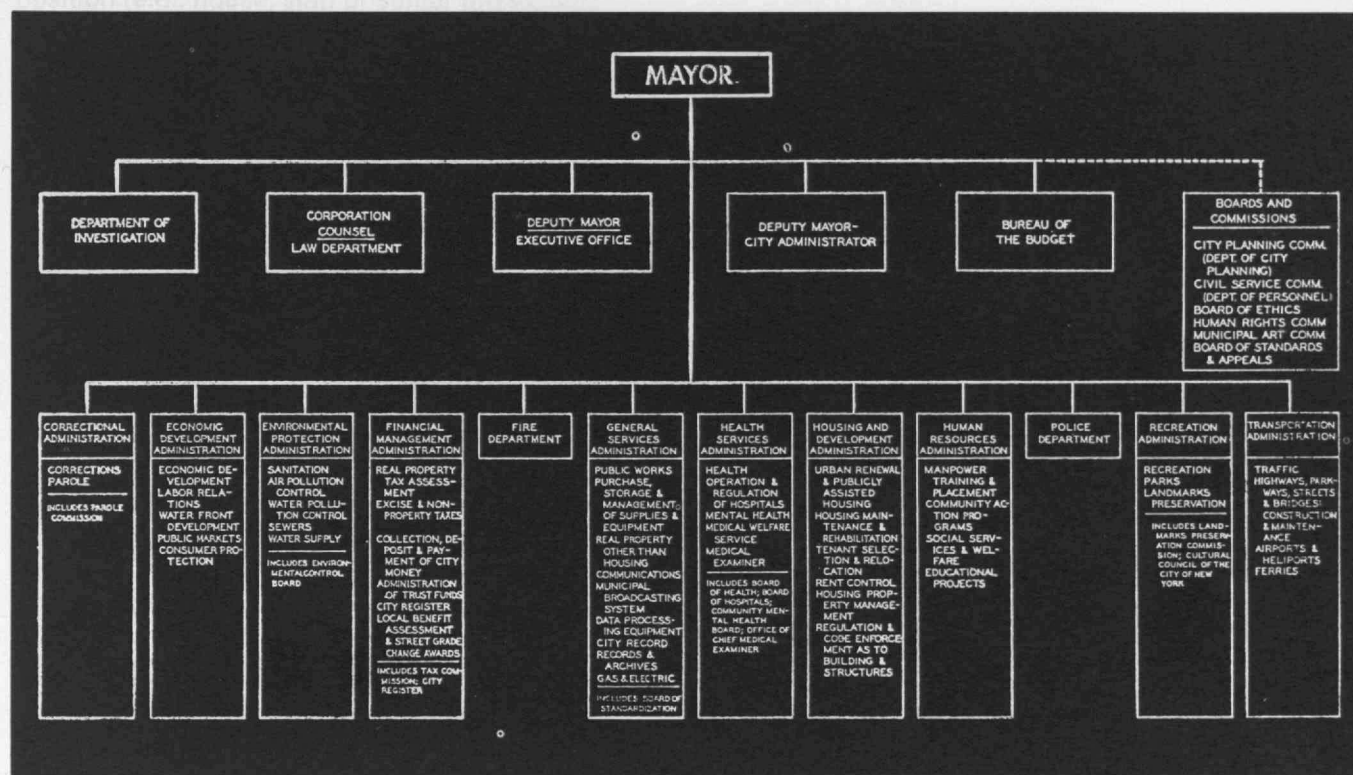
His goal is to produce a usable representation—one that can be objectively verified or rejected with reference to data from the real world. It is difficult to find fault with these objectives. Most city administrators agree that it is desirable to develop structures within which the implications of factors influencing complex management decisions may be analyzed. However, although systems analysis "makes all kinds of sense" as a general approach to large-scale management problems, administrators frequently insist that "special considerations" make it inapplicable to their city at this time. Why? I would suggest that human rather than technological reasons have impeded the broad application of systems analysis.

The Problems of Management Involvement and Abstraction

Management must be involved in the systems analysis process. A technical staff may handle the details of documentation and programming, but management must determine the scope and focus of analysis and insure that prevailing conditions are represented by valid measures of executive action and environmental response.

Systems analysis begins with the manager's rep-

This organization chart, presented by the Mayor's Task Force on the Reorganization of New York City Government, suggests the complexity of the organization and its functions. Systems analysis as described by the author is applicable to each sub-system as well as to the whole, and the author uses the Health Services Administration as an example.



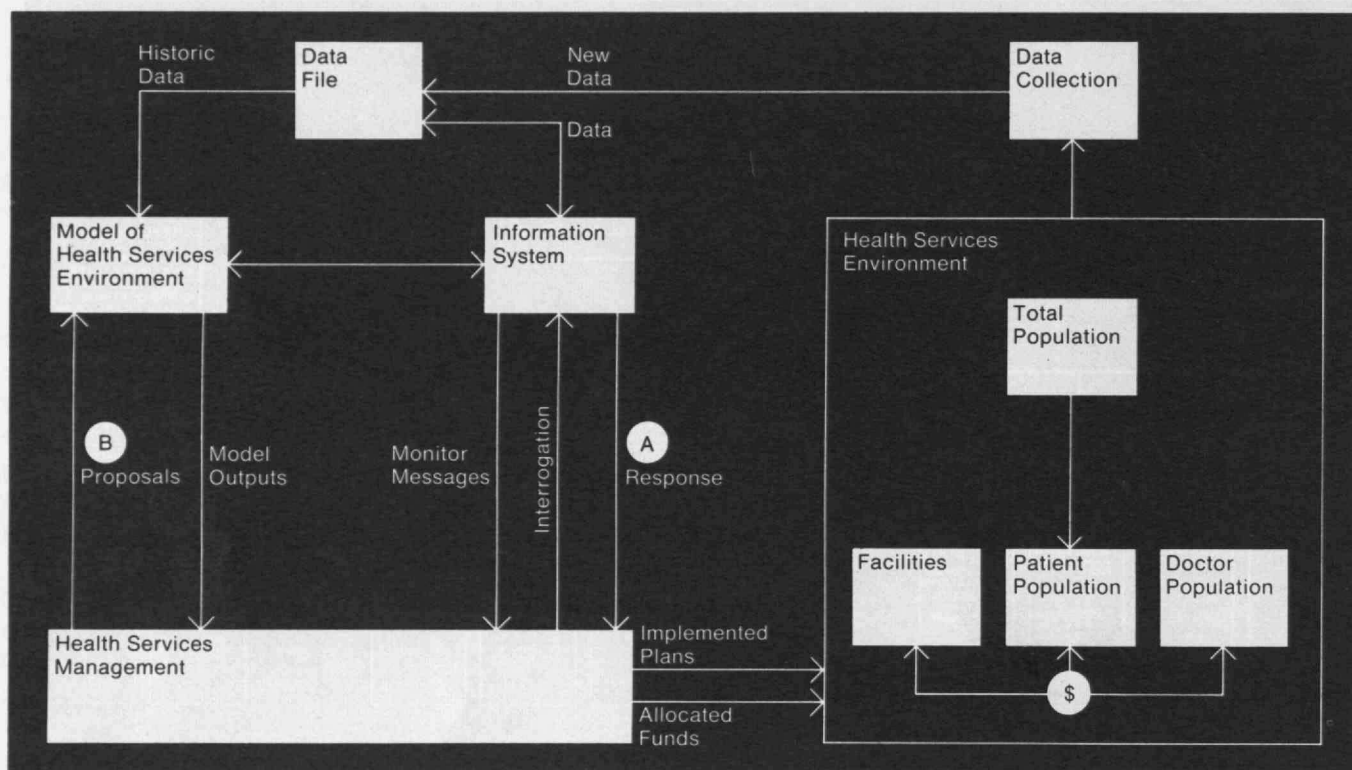
cent Task Force on the Reorganization of New York City. From this perspective the Task Force members concluded that "... New York City, confronted by municipal problems of enormous magnitude, beset by pressures of incredible intricacy, simply does not possess administrative machinery adequate to this task of conducting its business effectively." Their recommendations were summarized in a structure, an administrative system, designed to be "... supple enough to be readily responsive to the policy decisions of the city's elected leaders and efficient enough to deliver municipal services to its people when and where needed without waste of money or time."

The organization chart above summarizing the agency structure proposed by the Task Force illustrates the complexity of this aspect of the city system. Moreover, it is important to note that each

box which is shown on the organization chart represents a complex sub-system itself worthy of systems analysis.

The Health Services Administration, for example, was to encompass the activities of four previous departments. The Task Force found that the previous fragmentation of the Health Services Administration into several departments had wasted resources in duplication and inefficient utilization and seriously impaired the city's ability to bring these resources to bear effectively to meet its needs. In creating the new centralized agency, the Task Force hoped to establish an administration with the capacity to perform long-range planning and to apply modern methods of analysis to the co-ordinated direction of health services. But how does one go about managing the complex responsibilities of this department? How does

The structure of a health services management information system. Management can interrogate the system concerning the current state of the environment at the interactions noted by A and can test proposed programs by the interaction set marked B. Proposed plans are communicated to the information system, which establishes hypothetical conditions for the model. Results obtained from the model are then transferred to the information system, which formats them for presentation to management. Following this process, management is able to evaluate the conditional results of proposed programs using the same procedures and equipment employed to assess the current state of the environment through interrogation.



one develop, implement, and evaluate a coherent program that will integrate the clinical, preventive, and mental health services of a great city?

An Application of Systems Analysis

The Health Services Administration provides a useful example in which to demonstrate the method and power of systems analysis in city management.

Before attempting to view the environment controlled by the Health Services Administration as a composite whole, we must create a framework for analysis which can be used to define system elements and to describe interactions among elements.

The human mind is well suited to this type of analytic structuring. We are able to define the parts

of a system and describe interactions among a limited number of parts under specified conditions. But the human mind is simply incapable of complex synthesis. Fortunately, computers are able to perform this job. If we can identify the parts and describe single interactions, the computer can be used to determine what would happen if all interactions among all parts occurred simultaneously as in the real world.

Elements of the City Health System

An examination of the health services environment suggests four major elements of the city health system. These are: (1) health service facilities, (2) doctors, (3) the population at large, and (4) patients treated in the health service facilities.

Four types of health service facility are encountered in most major metropolitan areas. These are:

(1) medical centers, (2) community hospitals, (3) extended and chronic care facilities, and (4) ambulatory care facilities. Each class of health service facility can be described in terms of several attributes including: geographic location, number of beds, special and routine equipment, doctor availability, supporting personnel availability, pharmaceutical inventories, special unit capability (e.g., cardiac surgical team or renal hemodialysis facility), teaching program, and budget.

The population of doctors associated with one or more regions of the health administrator's jurisdiction may be defined in terms of: age, specialty, position (e.g., house, staff or senior physician), stage of training, specific qualifications, affiliation with specific facility, language skill, and location of practice.

In describing the people living within the health administrator's jurisdiction, one is primarily concerned with the probable health needs of various population segments. An expected incidence of indication (illness) can be derived from the following attributes: geographic location, age, sex, and such socioeconomic indicators as income, family size, marital status of head of household, and number of persons per room in dwelling unit.

Although they are not directly applicable to the demand determination, other factors such as primary language may be relevant to assure an effective match between the population and the facilities in a region.

Ideally, the health administrator should have access to relevant medical statistics derived from a complete health record for all persons in his region. From a practical standpoint, access to this level of data is available in only a small fraction of medical facilities. Working within these constraints, the systems analyst might define the patient population in terms of measures (or estimates) of the following type: geographic location, age, sex, socioeconomic indicators, previous history of health service facility interaction, and medical history.

Interactions Among System Elements

Once these four major elements of the medical system—facilities, doctors, population and patients—have been defined, the systems analyst must describe the dynamic processes involving these elements. For purposes of illustration we will examine four processes occurring within the health services environment. These are: inter-facility interactions, doctor-facility interactions, patient-facility interactions and facility change.

Typically, available health facilities include doctors' offices and clinics, community hospitals, and re-

gional medical centers. Interactions among this hierarchy of health service facilities may be described in terms of the transfer of trained personnel, drugs, equipment and patients. Data describing these processes would ideally be time- and indication-specific.

Doctor-facility interactions would ideally encompass information about the time and extent of each doctor's contact with specific facilities and the proportion of each doctor's time devoted to each specific activity; it would be particularly useful to recognize the allocation of doctors' time to such diverse activities as teaching, operating versus follow-up, nursing care, locating patient records, laboratory work, private patient consultations, ward service, emergency service, and out-patient treatment. In the absence of this detail it may be impossible to assess the effectiveness of doctor utilization within many medical facilities.

Patient interaction with a health facility can be described in terms of: time and extent of contact, symptoms presented, indications exhibited, nature and extent of doctor contact, tests and treatment given, and drugs prescribed.

In evaluating the quality of service provided by a facility, it may also be useful to note the degree of patient satisfaction with services rendered and the doctor's assessment of the effectiveness of the treatment. In this latter context, we would be concerned with complications of therapy, patient sign-out against medical advice, and the incorrect application of medication within the hospital or home.

The systems analysis must also encompass processes through which facility attributes are modified over time. This includes personnel turnover (extent and rate), capital expansion (equipment and buildings), and renovation of existing facilities.

A Health Services Management System

The systems analysis process produces a model of the health services environment using all of

the parameters discussed above. This model may become the basis for an information system through which the Health Services Administrator plans for, monitors, and evaluates his environment. The model identifies the elements and processes through which activity in the health services environment is to be described, and specifies the information on the health services environment to be gathered regularly and included in the information system data bank. The data file serves as the reference source for the information system and provides the historic data base for starting the model.

Management has the ability to interrogate the data file for information regarding the current state of the environment and as a basis for testing proposed programs. Once policy and strategy have been finalized, the proposed plan and budget are established as references, and model outputs describing the plan are generated for use by a monitor program. As plans are implemented in the environment, the monitor program compares actual measures with model outputs, and significant deviations from plan can be referred to management for special attention.

System Utilization

The management information system which has been described will help health service management perform the following six functions: monitoring the health status and determining the health needs of the population, establishing long-range plans and objectives for the health service system, co-ordinating the use of health resources, maintaining environmental defenses, monitoring the quality of medical care and hospital facilities, and evaluating medical care and health facilities against objective standards.

With the inclusion of budget data the system can provide an evaluation of facility cost-effectiveness in terms of dollars per patient treated. By combining the budget information with service evaluation data, cost-effectiveness studies can be expanded to include measures of the quality as well as the amount of service provided by each facility.

A New Style of City Management

This example of health service management supports my contention that man can make the city responsive to his needs if he will structure his environment, establish explicit objectives and criteria of evaluation and utilize the computer to synthesize and maintain a representation of the total environment.

As the computer assumes this function, the manager's role must change. Little or no time will be spent in routine analysis, evaluation, or alloca-

tion, since authority at this level will have been delegated to a computer-based system. The executive will thus have time to concern himself with broader policy problems which he will approach with increased effectiveness because he has more meaningful data and a better (model-based) understanding of his environment. He will be concerned with problem definition, and he will devote substantial time to the broader planning functions which are now often neglected because of day-to-day crises. Much of his time will be spent in increasing his understanding of the environment and in refining his insights into planning and communication processes which are his area of expertise. He will spend substantial time building models—making explicit, testing, and validating or rejecting hypotheses regarding the nature of his environment and his impact on it.

Freed from the detail of routine commitments and provided with the ability to study the implications of new concepts and approaches, the city executive will have the means to monitor, evaluate and control his expanding environment. He will enjoy a new freedom to experiment with creative ideas and he will be equipped to responsibly apply the great resources of his city to meet man's needs.

Arnold E. Amstutz, '58 (Ph.D.'65), is Associate Professor of Management in the M.I.T. Sloan School of Management, where his principal teaching responsibilities are in the field of marketing. He has developed several models and systems used in the M.I.T. Marketing Game to provide marketing management experience in both undergraduate and graduate courses; and he has contributed widely to professional journals and publications.

The growing role of science, engineering, and management skills in assuring the nation's welfare and progress suggests that no magazine such as Technology Review should ignore political affairs in a year of an important national election. Thus it was that immediately after the national conventions of the two major political parties, Republican and Democratic nominees for President of the United States were invited by the Editor to contribute to this issue of the Review.

In response to this invitation, Mr. Humphrey has supplied the essay which appears on the following pages. Mr. Nixon has written to the Review that his position paper on the progress of science and technology could not be available before our September 20 deadline. But he has suggested that a Guest Editorial in the magazine Forum for April, 1968 (of which excerpts are printed below), may be of special interest to Review readers.—J.I.M.

The National Job Bank

Today, many of our people are enveloped in a vicious cycle of poverty. Because they do not have a good education, they cannot get a good job. Because they cannot get a good job, they cannot afford decent housing. Because they live in slum housing, they find it difficult to establish a sound and stable home for their children. And their children go to inferior schools, which insures the perpetuation and expansion of the cycle.

The cycle must be broken at every point—jobs, education, and housing.

In the long run, quality of education is the most important factor in my view. But even if we were to transform our educational system overnight, the result of the miracle would not be felt for years—for education, by its very nature, is a time-consuming process that proceeds and builds in logical steps. . . . Decent housing is vital; but housing alone can never resolve the basic conditions of ignorance, joblessness and despair.

* * *

What is needed now, and what can be provided now, is the dignity and satisfaction of working for a living and earning the money that will give a person the economic power to buy the things that make for a decent home and a good life.

What can we do to make it possible for more people to hold productive jobs?

We know that there are three requirements for a man to be productively employed. First, he must be qualified for the job; second, the job must be available; but third, he must know about the job. Thus far, we have concentrated on the first two conditions, which is certainly not wrong, but we have failed to place adequate emphasis upon the third. It is in this area that I believe that rapid progress can be made, and it is to this area that this modest proposal addresses itself.

* * *

I propose that we use existing computer technology to match the unemployed with available jobs—to match the qualifications of a job-seeker anywhere in the country with a job opening anywhere in the country.

How would it work? One approach would be to establish a major computer center in this country with scores of branches in the depressed sections of our cities. The branch offices would be easily accessible to anyone who wanted to work.

A person could walk in off the street and give all the essential facts to a computer operator—what kind of training he had, what kind of educational background he had, in what area he wanted to work, whether he could move to a new area, what kind of income he needed, how many hours he could work. This information would then be fed into the computer which would have been previously stockpiled with the job opportunities in private industry and business, in nonprofit organizations and in government.

The computer could then provide the applicant with a print-out of the opportunities available in the community, the city, the state and even the nation. The purpose would thus be to expand his range of job options, to expand his freedom of choice.

* * *

As our experience with computer job-matching grew, I can envisage a time when we could program the computer to provide people with information about the available services of which they are now unaware. These supportive services would include legal aid, medical aid, economic help and training and social and spiritual counseling.

Such a program is feasible. . . . The time has now come to implement such a system on a nationwide basis—to put computer technology to work resolving part of the complex crisis that faces us today.

—Richard M. Nixon

This photograph records a happier moment during the September visit of Hubert H. Humphrey to Boston with Senator Edward M. Kennedy (left). After the episode, Robert A. Dennis, '70, in *The Tech* wrote of Mr. Humphrey's trials: "... his is the penalty of guilt by association; for he himself is not directly responsible for the tragedy of our seemingly inextricable campaign in Vietnam. Yet, in the wake of Chicago and in the light of the current campaign in which Vietnam has become a forgotten issue, one has no real regrets that Boston gave Mr. Humphrey the most hostile reception of his campaign." (Photo: Lenscraft Studios)

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Toward Bridges of Understanding

I appreciate this opportunity to communicate with the engineering community. I consider myself a humanistic engineer, and many of my friends in the professions of science and engineering are truly humanists.

A recurring theme throughout my 24 years of public office has been that of building bridges. Throughout the ages, the bridge has been a universal symbol not only of the engineer's technological achievements but also of communication, hope, beauty, man's higher aspirations for meaningful contact. In literal terms, the bridge is the engineer's symbol. But it has also inspired the poetry of Hart Crane, the drama of Arthur Miller, the music of Tin Pan Alley. It symbolizes hope and freedom to those who are the prisoners of geographical and political borders. It not only spans rivers but links people and communities.

Throughout my career, I have been for building bridges. I oppose building walls. They only reap a harvest of hate. I'm for building bridges, through technology, to outer space and the depths of the ocean; even more important, bridges through human understanding and communication, between black and white, young and old, rich and poor, rural and urban, urban and suburban, north and south nationally, east and west internationally. In short, I'm for building bridges of both transportation and communication.

This requires better bridges of understanding and co-operation between technologists and humanists. It requires of the President of the United States, who must provide national leadership in the setting of goals and priorities, both an understanding of the human and social needs and the desires of our people and an understanding of the present capability and promise of science and technology, to the end that technological knowledge can be applied to the solution of real and urgent problems of society.

This, it seems to me, is the fundamental role of the engineer: to bridge the gap between knowledge

and accomplishment; to translate the theoretically possible into hard, useful, practice. Engineers, no less than politicians, must practice the art of the possible.

Engineers and the Nation's Priorities

Ours is a technological society and America is the technological leader of the world. Scientists and engineers have played a dominant role in rocketing us into this era, and they will have a similar influence in transporting us into the future—or out of it. Our scientific and technological advances of the last quarter century have enabled us to extend and improve the quality of life of all human beings. It is hardly a new thought that they have also enabled us to examine life itself.

Albert Einstein was, perhaps, the pre-eminent scientist of our time. But I think of him as one of our pre-eminent humanists as well, because he exemplified the scientist who takes moral and intellectual responsibility for the social consequences of his theoretical acts. Twenty years ago, in *A Message to Intellectuals*, he wrote:

"We scientists, whose tragic destination has been to help in making the methods of annihilation more gruesome and more effective, must consider it our solemn and transcendent duty to do all in our power in preventing these weapons from being used for the brutal purposes for which they were invented. What task could possibly be more important for us? What social aim could be closer to our hearts? We must build spiritual and scientific bridges linking the nations of the world."

It is a bitter irony that in this age of unsurpassed technological sophistication and know-how, there are still men seeking high office who would appeal to the baser passions of hate, fear, jealousy and bigotry in proposing solutions to the problems which confront us. With all our technology and science, we have made little progress since the ancient Hebrews, the classical philosophers of Greece, and the early Christians who also struggled

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with the problems of peace and disorder. In the same message, Einstein summed it up so well:

"This is the age-old problem with which Plato, as one of the first, struggled so hard: to apply reason and prudence to the solution of man's problems instead of yielding to atavist instincts and passions."

I am not suggesting that the research and development community has created the ills of society and is thus responsible for solving them. Nor, on the other hand, would I agree that the developer of hardware is entitled to immunity, as a citizen, from the obligation to participate in the development of policies for the appropriate use of that hardware. The application of hardware, the location of a bridge, require the reasonable and prudential development of values and priorities. Engineers, like those of other learned professions, are trained in the application of intellect, reason and prudence. As citizens, they must cultivate humanistic, aesthetic and social values so that they can contribute to the solution of social problems and the setting of national policies and priorities.

A political leader, to be worthy of the name and the trust, must act decisively and, in so acting, must also apply reason and prudence, not passion and prejudice. One current example—the issue of the nonproliferation treaty—will illustrate my point.

Reason and prudence dictate that we must halt the dangerous proliferation of nuclear capability in the world. Technology can be depended upon to police the treaty now pending ratification in the Senate. The odds in favor of world catastrophe increase geometrically with the addition of each new nuclear power. The fact that the Soviet Union has committed atrocities such as the recent action against Czechoslovakia alters those odds not at all. To obscure this fact, and to react out of pique, by appealing to political passions is totally irresponsible behavior on the part of a leader. Decision-making by passion can lead to indecision or, worse yet, recklessness and brinksmanship. In this matter, as in many others, both foreign and domestic, which now confront our society, I call upon the scientific and engineering community to contribute to and join in the national dialogue of our times.

The demands placed upon scientists and engineers in the 1970's by government, industry and the university, working separately and in partnership, will inevitably increase. I am not unmindful of the fact that both the academic and industrial communities are, with respect to the conduct of research and development, dependent to a great extent upon the vicissitudes of the federal budget. High on my

agenda will be further consideration and refinement of these delicate and interdependent relationships. Similarly, it is vital that we continue to explore the problems of developing better mechanisms for formulating national science policy.

Technological Capabilities and Limitations

It is out of my deep involvement with the complexities of developing national policies respecting science and technology that I cite the necessity of bridging the worlds of science and government, technology and humanistic goals. We will not transfer the technologies of space to the use of man on earth without engineers. We will not solve the problem of world hunger through such innovations as farming the seas for protein without the scientists and engineers. We will not overcome poverty at home or underdeveloped economies abroad, nor will we overcome the environmental problems of storms and floods, polluted air and toxic water without technology. But we can accomplish none of these things unless the communities of science, engineering and industry are aware of and committed to these human goals.

The application of science and technology has already achieved a marked improvement in the quality and longevity of our lives. But it has also seriously upset the balance of our physical, social and political environments. Virtually every decision of the next President of the United States will require an understanding of our present and potential technological capabilities and limitations. He will have to be capable of seeking and comprehending the advice of scientists and engineers, just as he traditionally has sought the advice of lawyers, accountants, economists, educators, and business executives. The role of the technological adviser is increasing in the councils of government, and I am delighted to say that, more than ever before, engineers and scientists are acquiring the humanistic and political sensitivities which will be required of them. We need bridges of steel and of understanding and communication. Without them we are in trouble.



Chevrolet pokes its Nova in the eye of little foreign cars.

The 1969 Chevy Nova is the kind of car that can make an economy import wish it had never left home.

It costs very little to get into.

It costs very little to run.

It is dependable almost to the point of monotony.

And unlike a lot of imports, Nova brings you all these talents in a most attractive package.

(We re-direct your attention to the photograph above.)

As for room: The coupe seats five,

the sedan seats six, and the trunk holds almost 14 cubic feet of whatever you care to put in there.

Nova rides a lot like the big Chevrolets. Very smooth, very quiet, with generous amounts of rubber cushioning.

The outside trim, the interior, the instrument panel have all been reworked and there are 12 new colors.

The steering column locks now.

There's a bigger inside rearview mirror, a sporty new two-spoke steer-

ing wheel and easier to reach door lock buttons.

There's a no-clutch transmission called Torque-Drive that sells for under \$70 if you're tired of shifting.

Now, getting back to those little foreign cars.

On second thought, why don't we just forget them.



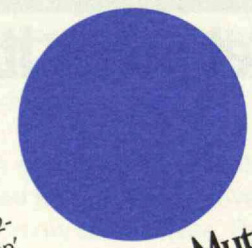
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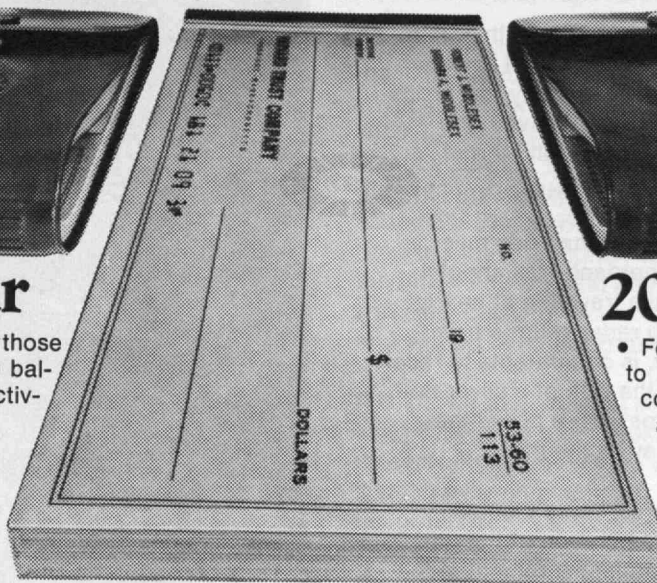
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Trend of Affairs

Icarus by Radar

Icarus, making its close approach to the earth in mid-June, became the first asteroid ever tracked by radar and, in the words of Lincoln Laboratory radar astronomers who reported the achievement with the Haystack radar system, the "most difficult" target ever successfully tracked by this means.

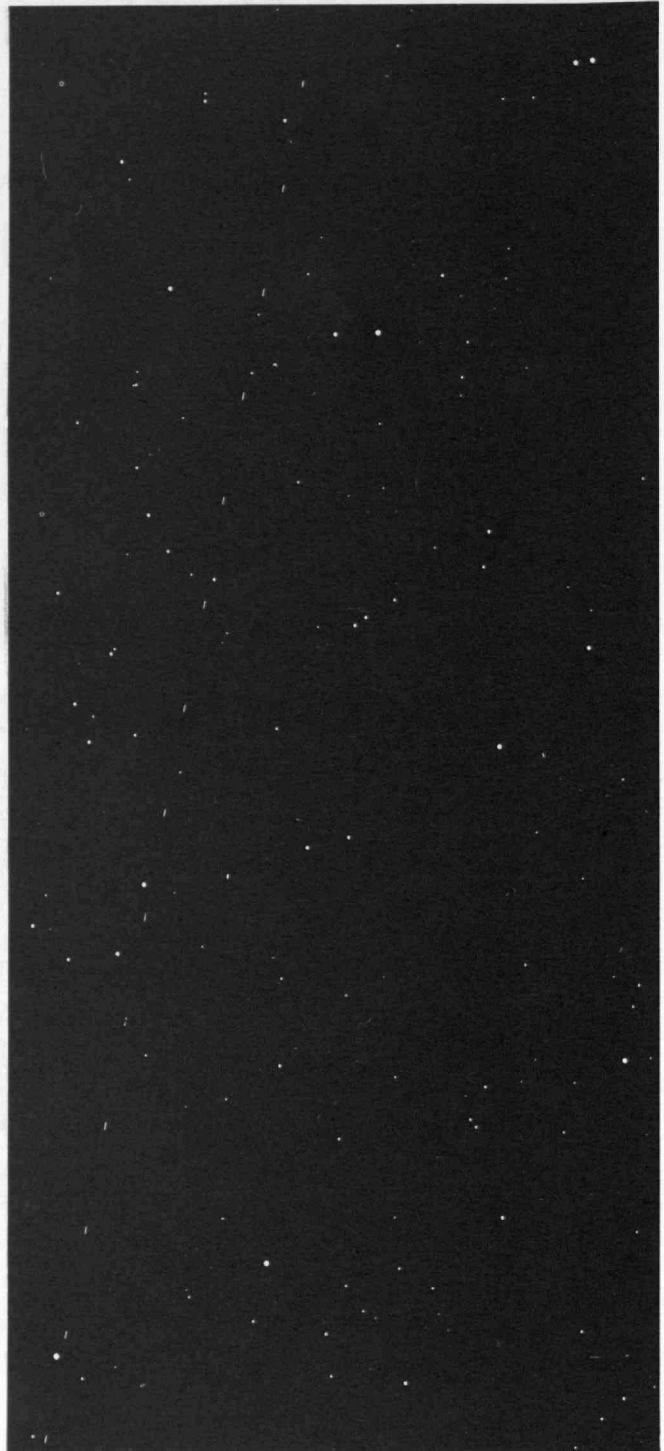
The asteroid is estimated to be less than one mile in diameter and at its closest approach was about 4 million miles from the earth while traveling at nearly 70,000 miles an hour. Receiving radar returns from Icarus, said Lincoln Laboratory, is comparable to receiving radar echoes from a target the size of a silver dollar 22,000 miles from the earth or from a target the size of a Volkswagen as far away as the moon.

"The successful tracking of Icarus," said Lincoln Laboratory, "is a dramatic demonstration of the advanced space-radar tracking and measurement techniques developed for the Air Force."

The Lincoln Laboratory astronomers, including Michael E. Ash, '59, Richard P. Ingalls, '50, Gordon H. Pettengill, '48, Irwin I. Shapiro (who is also Professor of Geophysics and Physics at M.I.T.), and William B. Smith, S.M.'55, said their success was "attributable in no small measure" to optical observations from the University of Arizona and the Lick Observatory by which they were able to determine the precise area of the sky in which to work.

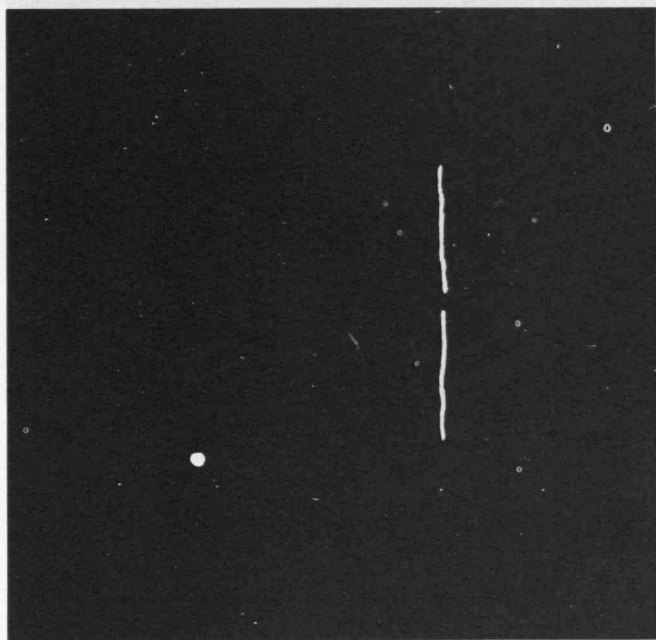
Though the Icarus sighting was a prodigious feat for radar astronomy, it had a special interest because the Icarus orbit—which will be precisely determined from the radar data—is a new vehicle for testing Einstein's theory of general relativity and other theories of gravitation.

The relativity test is the same as the well-known test that concerns the orbit of Mercury which, like Icarus, travels around the sun in an elongated, non-circular path. In both cases, the orbit itself "precesses" slowly around the sun, so that the actual route of each body is a continuing spiral, not a closed loop. It is the rate of this precession that has provided one of the few opportunities to date to test general relativity against



Icarus made its mark among visible-light as well as radar astronomers during the asteroid's passage within 4 million miles of earth on June 14. The photograph on the opposite page was made at the Palomar Observatory by W. J. Luyten of the University of Minnesota; it consists of 16 exposures of Icarus spaced four minutes apart, so that the asteroid forms a slanting row of short dashes. Meanwhile, radars at Jet Propulsion Laboratory in California and Lincoln Laboratory at M.I.T. were making the first radar observations of an asteroid ever reported. (Photo: Mount Wilson and Palomar Observatories from Sky and Telescope)

Photographs of Icarus such as that below made at the University of Arizona were credited with an important aid to Lincoln Laboratory's successful radar tracking of the asteroid. Icarus is the starlike image below center; the adjacent star trail was interrupted to provide a reference point. (Photo: University of Arizona)



Newtonian gravitational theory. The observed rate of Mercury's precession agrees very closely with the rate predicted by general relativity, but the unusual, extremely eccentric orbit of Icarus, together with its small size and its close approach to the earth, makes it an even better subject than Mercury for precise measurements.

The Lincoln Laboratory team reported that the echo signals from Icarus were very weak, near the lower end of the range of possible echo strengths which had been estimated in advance; "extensive signal processing," they said, "will be required to extract all the information."

The signals were detected by integrating data from more than 400 radar runs, made over a period of about 18 hours on June 13 and 14 with the Haystack system. Each run consisted of a 43-second transmitting interval (approximately equal to the time required for radar signals to travel from Haystack to Icarus and back), followed by a receiving interval of the same duration. Tracking operations were hampered by heavy clouds and frequent rain which, according to the Lincoln Laboratory report, reduced Haystack's sensitivity.

Clock Watching

A small track into the uncharted mysteries of how mammals adjust their physiological functions to the earth's 24-hour day (see Technology Review, Mar., 1968, p. 23) was described this summer by four M.I.T. scientists at the Third International Congress of Endocrinology in Mexico City. Dr. Richard J. Wurtman, Associate Professor of Endocrinology and Metabolism, reported that melatonin, an endocrine produced by the little-known pineal gland, regulates the activity of a special class of nerves that rise in the midbrain and extend to higher brain centers.

It is known that, at least in rats, the pineal responds to light, serving as a "biological clock," by increasing its secretion of melatonin with darkness and decreasing it with environmental light. Now Dr. Wurtman and his group have established that these variations in melatonin are accessible to many parts of the nervous system through the midbrain, extending the influence of this "biological clock." But he admits that "we do not know what biological systems or structures watch the clock or care about time."

Dr. Wurtman says the new information about melatonin is significant in several ways: it marks the first time a hormone, such as melatonin, has been found to affect a specific region of the brain; it suggests new studies on the function of other midbrain nerves that terminate elsewhere in the brain, to indicate other extensions of the "biological clock"; it suggests the development of melatonin-like drugs to influence brain activity; and it shows a link between the pineal and the hypothalamus, which in turn has a direct connection with the pituitary gland, where are secreted hormones which regulate a host of body functions.

Also significant was the observation that the midbrain nerve network sensitive to melatonin includes the only nerves in mammals which use a compound known as serotonin to transmit signals from one fiber to the next; and serotonin is closely related chemically to melatonin. Indeed, they demonstrated almost immediate increases in brain serotonin following injection of serotonin into the circulation of rats. Dr. Wurtman's co-workers were Dr. F. Anton-Tay, Dr. S. Anton, and Chuan Chou, all of the M.I.T. Department of Nutrition and Food Science.

Trend

Wanted: 216 Talents

The modern architectural student needs a two-way stretch: "He must stretch his mind in breadth to learn how his design decisions interact with the design decisions of others and also how they interact with the structure of men's lives in the non-physical realm;" and "he must stretch in depth to keep up with an ever-expanding body of research that can help him make the most effective decisions about any single detail of the physical environment."

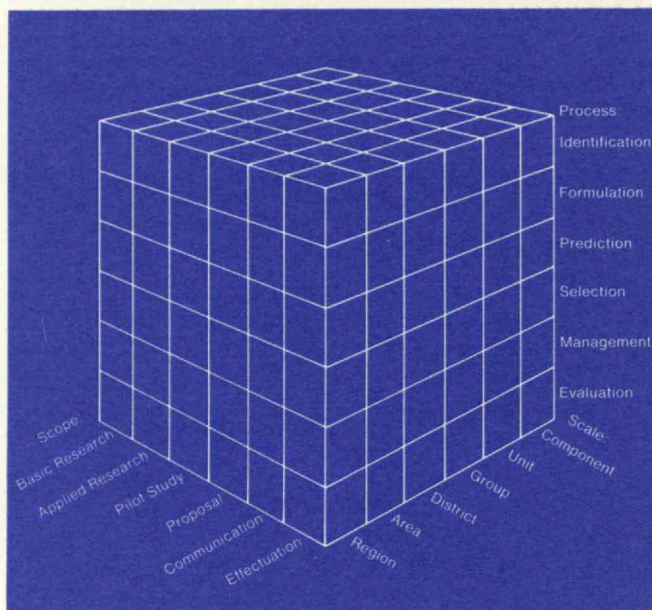
Because he and his schools have failed to achieve this, the schools and the profession are now unable to keep up with a "revolution of rising expectations" which results from growing public understanding of the complexity of environmental problems and public demand for their solution.

It was to address this weakness, and to recommend ways toward its resolution that the American Institute of Architects commissioned a study of education for environmental design, directed by Robert L. Geddes and Bernard P. Spring, M.Arch.'51, of Princeton University. In its final report, the project has proposed three major goals for environmental design education:

1. The student should be able to work effectively within the real-world constraints that shape present-day practice.
2. The student should be able to comprehend and respond to the continuing changes in the social, economic, political, scientific, and technological setting of our society.
3. The student should be able to formulate a concept of a better environment beyond present-day constraints to give direction to his efforts.

And the central problem, says the study, is to find "a mix of policies and procedures that will strike a balance among all three of these goals." The complexity of this task is made evident by a three-dimensional diagram (above) which describes the steps in the problem-solving process, the divisions of the scope of work, and the gradations of scale embodied in the large task of environmental design. In the end there are 216 categories of ability required in environmental design. No individual can contribute in all these, says the report, but he must understand them all so that he can see his activities and skills in relation to those of others.

A three-dimensional diagram of the task of environmental design, devised for a study of modern architectural education for the American Institute of Architects by Robert L. Geddes and Bernard P. Spring, M.Arch.'51, at Princeton University. There are 216 intersections, each representing a relationship between the three main dimensions of the environmental design task. The authors suggest that the chart can be verbalized in 216 sentences; for example, statement 1De would be, "Identification of the needs, goals, resources, and priorities of client, user, and community for a design proposal at the unit (single building) scale."



Unutilized Ideas

At least half of the employees of two government-supported laboratories at M.I.T. have told a Sloan School of Management research project that they have had ideas for new products or services whose scope lay outside their laboratory's interests. But the laboratories themselves have paid little attention and less than a third of the workers themselves have made any effort to develop their ideas. The laboratory workers explain their apparent indifference to their own inventions chiefly on two grounds: lack of time or facilities to develop their ideas, and lack of motivation or interest in doing so because of their satisfaction with their present jobs.

Analyzing their survey data, Donald H. Peters and Edward B. Roberts, '57, of the Sloan School of Management conclude that experienced research workers are more likely to generate ideas for new products and services than inexperienced ones, and that while an orientation toward the development end of the technical spectrum is conducive to idea generation, work having no research content retards the generation of product ideas.

The research represented by these preliminary studies is now being continued in the Sloan School by interviews with laboratory workers and by efforts to evaluate the true significance of new ideas reported in various fields.

Romantics Awash

The cold wind of reality blew down on the U.S. Naval War College at Newport, R.I., this summer, and some of the unchecked optimism about the wealth of the oceans was its victim. The occasion was a national conference on undersea mineral resources, and George T. Coene of Westinghouse Electric Company summarized it for Victor K. McElheny, Science Editor of the Boston *Globe*, by saying he was glad to see that the "dreamers and the romantics are not running away with the oceans" after all.

Earlier, in his prepared paper, Mr. Coene noted that "too often the ocean enthusiast has forgotten that the recovery and processing of resources is a dirty business. He has also not taken into account that to be profitable we must process tens of thousands of mineral-bearing earth or thousands of barrels per day of oil. Too often we fail to consider that an ore body or oil structure must deliver its output to the continents where it can be beneficiated or refined and used by people. On the beach the mineral has a value which does not change because it happened to come from the ocean."

David B. Brooks, '55, an economist with the U.S. Bureau of Mines, took this argument even further with Peter Gwynne, Science Editor of the Boston *Herald-Traveler*, who wrote, "Estimating that by the end of this century the world's demand for minerals will be some three times present demand, Dr. Brooks nevertheless warned that this would not necessarily give ocean exploiters carte blanche to produce. History shows that reserves of natural resources do not become more scarce and expensive as time passes, said Dr. Brooks. In fact, as geologic and technological knowledge improves, new deposits will come to light and lower-grade ores become exploitable, offshore minerals will have to compete against these new sources."

But don't write off the oceans completely, said John A. Knauss, '46, Dean of the Graduate School of Oceanography at the University of Rhode Island, one of the conference sponsors. "There is no doubt that these resources will be exploited," he said. "The only doubt is about the time schedule."

Oceanic Constraints

The limitations on marine progress (see above) were the principal theme of a seminar sponsored by the M.I.T. Club of Washington late last spring, when several speakers sought to explain the nation's continuing frustrations in attempting large-scale development of ocean engineering.

It is a complex technology, and the resources going into its development have been remarkable for their small—rather than large—scale. For every dollar being spent in space technology, said Captain William M. Nicholson, S.M. '48, Manager of the Navy's Deep Sub-

mergence Systems Project, only one and a half cents is going into ocean development.

Most of these limited funds are being spent on hardware—a necessary prelude to more extensive ocean exploration and eventual utilization of its resources—and the cost of hardware is rising rapidly. Creation of a deep submersible today, Captain Nicholson said, costs three times as much as estimates made as recently as three or four years ago. The critical factor, he said, is the lack of basic engineering and scientific knowledge in this new arena. For example, data on the viscosity for compressibility of oils under pressures as high as 9,000 p.s.i. are unavailable. Gas absorption in human body tissues leads to physiological limitations about which little is known.

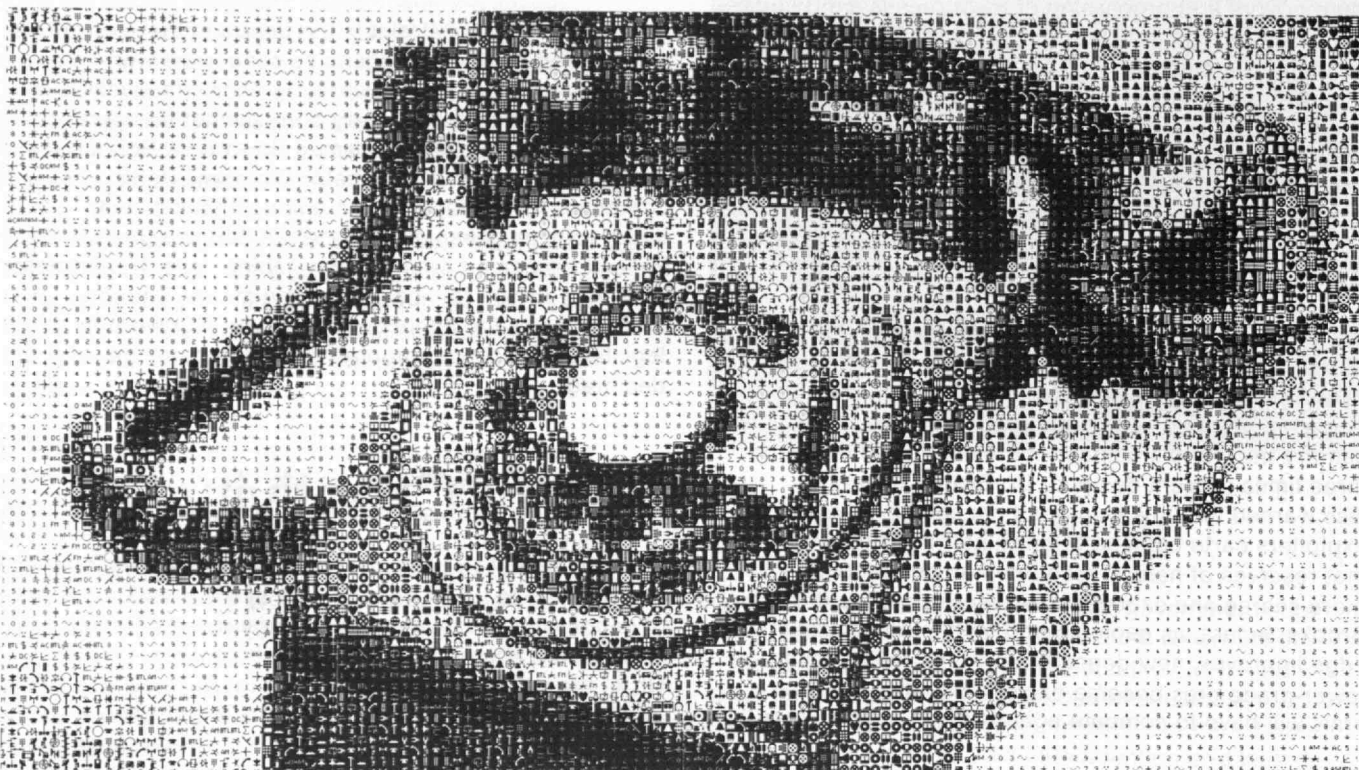
Another serious constraint is the failure of the several government and private agencies concerned with oceanographic research to work together effectively. "The need for a co-ordinating body cannot be over-emphasized," said Congressman Howard W. Pollock, S.M. '60, commenting on Senator Claiborne Pell's complaints of "independence among agencies with major roles in ocean development." Congressman Pollock advocated creation of a cabinet level Department of Marine Affairs to "insure that the marine environment receives the attention it deserves. Our work in legislation for oceanography has just begun," he declared.

Costly Creativity

Has the "digital revolution," which is bringing digital computation to be an integral part of the practice of geophysics today (see *Technology Review for Feb., 1968, p. 49*), absorbed too many technical resources? Or, in the words of James E. White, Ph.D. '49, who is this year's President of the Society of Exploration Geophysicists, are today's geophysical researchers matching their forebears in visualizing the geophysical exploration tools of the future?

In a guest editorial in *World Petroleum*, Dr. White recalls the 20-year dream of "geovision," an electronic display of geologic structures detected by seismic reflections, which has now been realized through modern computational methods. "But," he asks, "is anyone now actually working on a geophysical analysis and display system which stretches the capabilities of the digital computer to the same degree that 'geovision' exceeded the technology of its day?" And if not, why not? . . . Not, Dr. White says, because geophysicists lack vision and imagination, but perhaps because the high cost of current methods absorbs all the funds which might otherwise encourage the far-sighted worker.

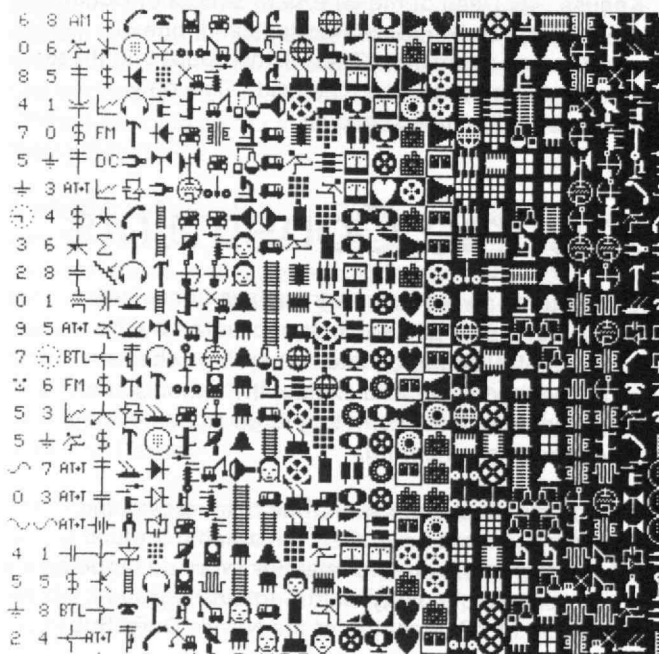
Two Bell Telephone Laboratories scientists have devised an "alphabet" of 196 characters from the communications arts drawn so that each falls in one of 16 density levels (below, right); and they have programmed a computer system to scan original photographs and present enlarged reconstructions in characters of the new "alphabet." The result is an intriguing "communications-in-communications" picture (below) as well as some useful information about human pattern recognition and graphical data processing. (Photos: Bell Laboratories Record)



Density Pictures

A new "alphabet" of density values and some intriguing computer-generated pictures of familiar objects have resulted from research on human pattern perception and computer languages for handling graphical data by L. D. Harmon and Kenneth C. Knowlton, Ph.D.'62, of the Computing Science Research Center at Bell Telephone Laboratories.

Their image system divides a 35-mm. transparency into 11,484 tiny fragments, scans each of these for its brightness level, and assigns a brightness number on a scale of 16. There is a corresponding alphabet of 196 micropatterns, 5 to 14 in each of 16 density values. When a photograph is to be reconstructed, the computer reviews the stored brightness numbers and picks at random from the alphabet a character with an appropriate density value. At viewing distances 15 times the picture width, the prints take on the quality of a continuous-tone photograph.



20 Channels in One

A new modulation device called TATS, designed for the U.S. Air Force by the M.I.T. Lincoln Laboratory, multiplies the simultaneous message-handling capacity of a tactical communication satellite by a factor of 20 or more.

TATS, which stands for TActical Transmission System, is a modulator/demodulator unit for use in association with many transmitter and receiver combinations. The TATS modulation technique, called "frequency-hopping," converts a voice or teletype message into a string of pulses that hop around in a specified pattern from one frequency to another within the frequency band covered by the radio channel in use. Thus several stations or terminals with different modulation patterns can use the same channel simultaneously without interfering with each other. The total number of such terminals depends on the frequency bandwidth available in the channel and on the transmitter power available from the various stations in the system. With TATS modulator-demodulator units the Lincoln Laboratory LES-5 satellite should be able to handle about 20 users at a time.

In its first airborne test this summer, Lincoln communications engineers in Lexington, Mass., used TATS to exchange clear, steady, error-free teletype messages with colleagues aboard an Air Force plane in the vicinity of Guam, more than 8,100 miles away, via the Lincoln Experimental Satellite LES-5.

Both the LES-5 satellite and the TATS modulation device were built at Lincoln Laboratory for communication experiments toward development of a Tactical Satellite Communication system for the Department of Defense. For this purpose LES-5 was placed in a high-altitude, nearly synchronous and nearly equatorial orbit, where it drifts slowly around the earth and makes possible long-distance communication tests in many parts of the world. At the time of the TATS test this summer, LES-5 was located over the Marquesas Islands, one degree above the horizon from Lincoln Laboratory and only four degrees above the horizon as viewed from the aircraft.

How Large Is Venus?

There are at least three figures for the radius of Earth's nearest planetary neighbor, and modern technology, at least at the present moment, offers no way to resolve the dilemma. Data from the Russian Venera 4 and U.S. Mariner V space probes have led to a value of 6085 ± 10 kilometers for the radius of Venus; radar data from M.I.T. Lincoln Laboratory and the Cornell Arecibo Ionospheric Observatory yield a figure of 6050 ± 5 kilometers; and radar data from the California Institute of Technology's Jet Propulsion Laboratory give a value of 6053.7 ± 2.2 kilometers.

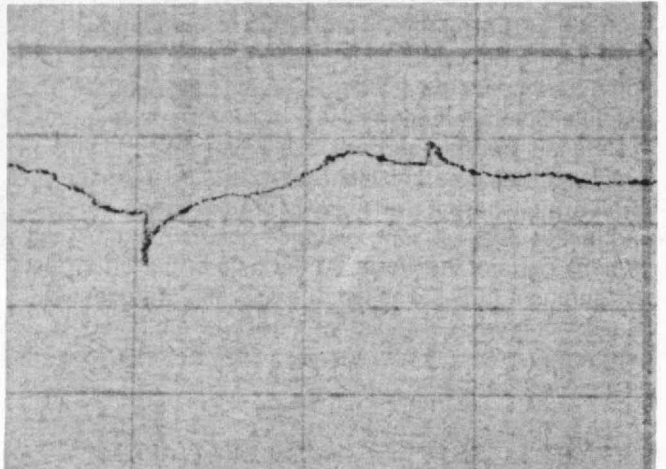
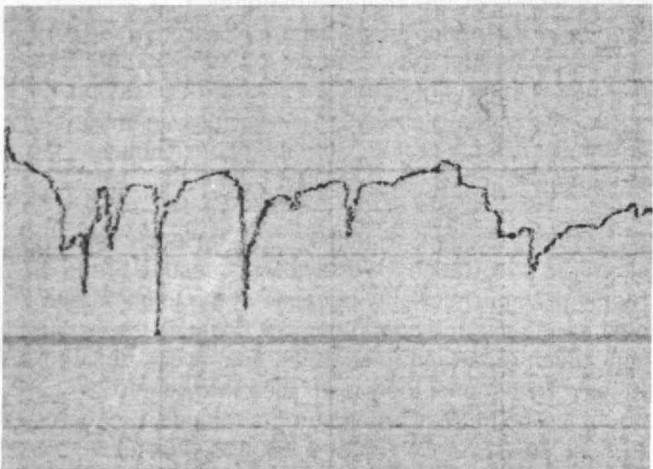
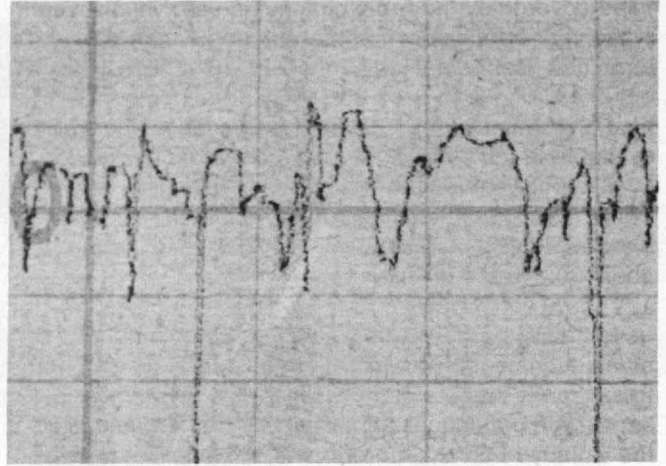
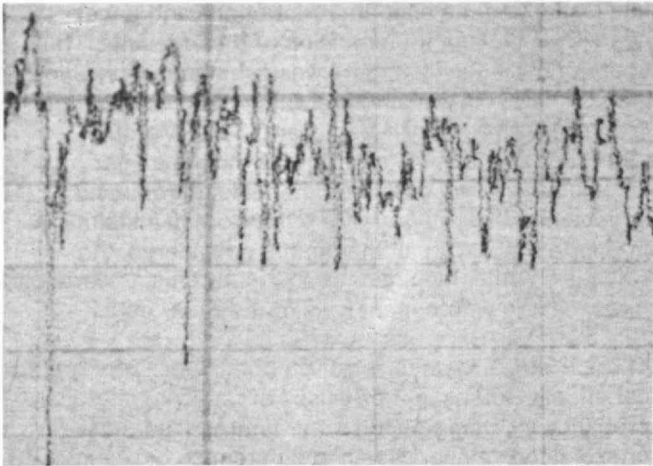
Eight M.I.T. and Cornell scientists, writing in *Science*

late last spring, detailed the frustrations and uncertainties which limit the precision of these results. Their figure of 6050 ± 5 kilometers was substantially smaller than the 6085 ± 10 kilometers which resulted from the first "analysis" of Earth-Venus and Earth-Mercury radar data in 1966; the new figures included later Lincoln Laboratory data from the Millstone Hill and Haystack radars and data from the Cornell installation in Puerto Rico. With all the factors considered, the scientists wrote, the space probe data remain "certainly incompatible with our analysis of the radar data."

There is some room for error on both sides. Topographical effects "offer slight promise" of resolving the discrepancy by changing the radar figures. There are unexplained smaller systemic differences between Haystack and Arecibo measurements, but they "do not alter the conclusion" of incompatibility. It is possible that Venera 4's altitude measurements were in error, but extending this assumption involved additional difficulties. Similar difficulties with other theories and observations of surface and near-surface conditions on Venus also limit efforts to obtain consistency, according to the M.I.T.-Cornell group.

But, they conclude in *Science*, "It is obviously of considerable importance to resolve this question of the radius of Venus, not only because of the implications concerning surface conditions but because the accuracy with which radar and radio observations can be used to test gravitational theories is also thrown into doubt." (The M.I.T.-Cornell authors include Michael E. Ash, '59, Richard P. Ingalls, '50, and Gordon H. Pettengill, '48, of Lincoln Laboratory and Irwin I. Shapiro and Martin A. Slade, '64, of the M.I.T. Department of Geology and Geophysics.)

A profile meter traces the progress of polishing an abraded copper surface 2½ centimeters in diameter. The pictures, left to right, top to bottom, show the recording of the original surface and of the surface after removal of 4×10^{-4} , 8×10^{-4} , and 17×10^{-4} grams of material, when polishing is nearly complete.



Molecular Polishing

One classical theory of polishing proposes that a polished surface is smooth on a molecular scale, while another suggests that a polished surface is rough but its features are smaller than the wavelength of light. But the mechanism of polishing has remained "the classical problem in friction and wear," according to Ernest Rabinowicz, Professor of Mechanical Engineering at M.I.T., who has now reached his own resolution of these long-standing questions. Professor Rabinowicz' conclusions stem from a series of experiments with polishing mechanisms and polished and burnished surfaces.

Using a profile meter, with which it is possible to attain a resolution of about 100 Å, it is easy, says Professor Rabinowicz, to test whether a surface *looks* smooth or *is* smooth. The profile meter confirms that as polishing proceeds the original sharp hills and valleys of a metal surface are replaced by a smooth profile; "the lack of prominent scratches is strong evidence against the abrasion theory of polishing," he says.

Comparison of weight loss during polishing with material loss as indicated by the profile meter reveals a close correspondence—evidence that polishing is material removal rather than material displacement.

Is polishing connected with the melting of the metal surface under the heat of friction? No: a polishing wheel moving below a critical speed removes material from a low-melting-point metal sample rapidly, and the resulting surface is polished. Above that critical speed the removal rate is smaller and the surface becomes matte or wavy. The transition, says Professor Rabinowicz, is associated with the melting point, and "it is logical to argue that in this case polishing only occurs when there is no melting."

Studies of the effect of particle size on polishing behavior convince Professor Rabinowicz that polishing occurs when there is not enough energy available at one spot to produce a wear particle or an abraded chip. Thus polishing is simply a material removal (wear) process conducted under conditions of low energy. Only one view of polishing, he concludes—removal of material on a molecule-by-molecule basis—is consistent with all the findings. This view is confirmed by research which shows that the polishing rates of metals vary inversely as their latent heat of evaporation, the latent heat being a direct measure of the strength of the bonds which hold individual atoms in the solid metallic lattice.

Nuclear Jigsaw

The high-gain breeder reactor holds the key to low-cost nuclear power for future generations, and the sooner its special capabilities can be introduced to balance fuel costs, the sooner public utilities can count on a measure of stability and independence from the vagaries of the commercial plutonium and uranium markets. Indeed, Joseph C. Rengel, '60, Vice President and General Manager of Westinghouse Atomic Power Division, says that "the timetable for nuclear growth hinges on successful development of a breeder system."

Today's water-cooled reactors require as fuel uranium enriched in the fissionable U^{235} isotope; and they produce in the course of power generation sizable quantities of fissionable plutonium. Six units of natural uranium are needed to yield one unit of enriched fuel; the other five natural uranium units must be discarded. The breeder reactor fits this pattern like the missing piece of a jigsaw puzzle: the present stocks of depleted uranium are sufficient to feed the breeder industry for more than 100 years, Mr. Rengel says, and the plutonium which is now a by-product of water-reactor operation is the second fuel of choice for fast breeder reactors. Thus the breeder reactor holds the promise of stabilizing fuel costs for the entire nuclear generating industry.

The industry's present goal is to make the high-gain breeder reactor economic by the year 1980; if this is achieved, uranium requirements for power generation to the year 2000 will be 1.1 million tons. But if the breeder schedule slips by five years, the market for uranium will increase by 200,000 tons. At 40,000 tons a year, this penalty, says Mr. Rengel, is \$1 billion a year.

Periodic Magnetism

The intensity of the earth's magnetic field varies from day to day. After certain regular variations are removed, the residual irregular variations constitute the geomagnetic "disturbance" field. These irregular variations have been recorded for almost a century with an index known to geophysicists as the International Magnetic Character Figure. Intensity changes are most pronounced during active periods of the sun's 11-year sunspot cycle, as huge bursts of corpuscular and electromagnetic energy from the sun disturb the earth's magnetic field. But even when the sun appears to be quiet, it may still modulate the magnetic field to induce cyclic fluctuations.

To study this cyclic pattern, Ralph Shapiro, Sc.D.'50, and Frederick W. Ward, Jr., '52, of the Air Force Cambridge Research Laboratories have made a rigorous statistical analysis of the daily magnetic field values recorded for 72 years. The analysis shows clearly the well-known 27.4 day variation of the disturbance field, but in addition Drs. Shapiro and Ward found a new secondary peak with a period of 29.4 days and a third, but less pronounced, peak every 26 days.

After discounting any lunar influence, or annual modulation, they offered two possible explanations for the quasi-periodic magnetic field fluctuations. One has to do with solar rotation. The visible surface of the sun, the photosphere, rotates more rapidly at the equator (25 days) than at the higher latitudes (31 days near the poles). Thus, three quasi-permanent active regions at varying solar latitudes, each with its distinctive rotation rate, could produce the three observed peaks.

The second explanation postulates a residual magnetic field between the sun and the earth. This magnetic field could modulate the solar wind (speeding up or slowing down the transit time of the solar corpuscular radiation between the sun and the earth) which, in turn, could modulate the earth's magnetic field.

Neither explanation possesses much more rigor than simple speculation—which is to say that a fully satisfactory model has not yet been developed.—(A.F.C.R.L. *Research Bulletin*)

Spiel mit MAC: A Berlin Conference

Computers are bringing about the world's second industrial revolution, relieving man of routine intellectual work just as the products of the first industrial revolution freed him from monotonous mechanical work.

And in the universities computers represent "a new conceptual movement which has a potential never before available for unifying goals and purposes . . . Of all the developments which we see before us, none promises to alter the established order of the academic community more than the high-speed digital computer."

These two statements, by Werner Koepcke, Professor of Structures at the Technical University of Berlin, and Gordon S. Brown, '31, Dean of Engineering at M.I.T., were the keynotes of a unique international conference on The Computer in the University sponsored by the two organizations with Ford Foundation support in Berlin this summer. There were 1,100 registrants from over 25 countries, including 18 from Yugoslavia. *Tagesspiegel* (Berlin) called it "the greatest German-American scientific convention ever held."

Charles L. Miller, '51, Head of the M.I.T. Department of Civil Engineering, stressed that computers require a special kind of environment which universities must now strive to create, and he warned that educational institutions must in turn be prepared to see computers "change the environment of the university." The approach to computer management which leads to administrative and machine efficiency, Professor Miller said, "stifles the basic success factors of computer activities" in an academic situation, conflicting with the "unique characteristics and roles of the university."

The conference provided ample evidence of just how ubiquitous is the computer today. It is, said Howard W. Johnson, President of M.I.T., "one of the foremost examples of technology working for man—expanding our ability to comprehend, to evaluate, and in many ways to control our resources and our environment. It is probable," he said, "that the potential of the computer is limited only by our imagination." Here are a few examples:

In university research: "As soon as most of the routine work inherent in the application of knowledge has been shifted to computers, university teams can study real-life situations of considerable complexity with reasonable effort." There is thus "a powerful new medium through which the faculty can contribute to the advancement of engineering."—Peter J. Pahl, Sc. D.'64, Associate Professor of Civil Engineering at M.I.T.

In traffic simulation: "Simulation by the computer makes it possible to determine characteristic parameters, such as delay, number of stops, length of queues, travel time and average travel speed. These parameters allow the evaluation of the quality of traffic flow."—Gunter Hoffman, Senior Teaching Assistant in Highway and Traffic Engineering, T.U.B.

In urban problems: "As an example of laboratory experimentation with social systems, I have in the last six months studied the growth, stagnation, and revival processes of a city. The model describes the processes of housing and industry construction and aging; it generates the flow of several classes of people to and from the city and the mobility between different economic classes. The model contains growth processes that start with empty land, fill it with structures, and produce the changing population mix as housing ages into slums and as new industries mature and decline. In such a model the processes of economic stagnation become clear."—Jay W. Forrester, S.M.'45, Professor of Management, M.I.T.

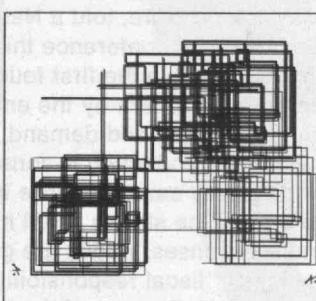
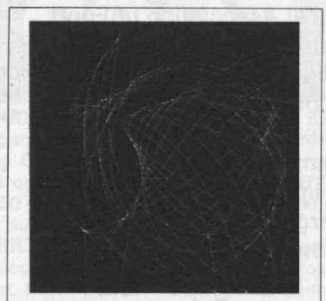
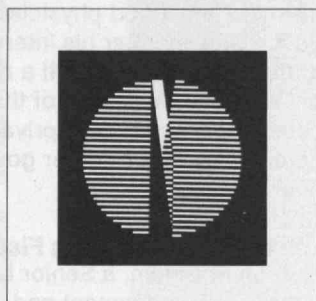
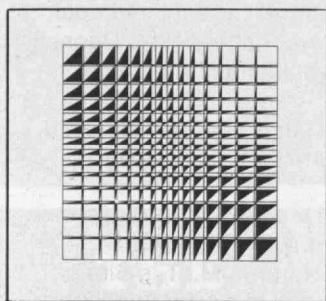
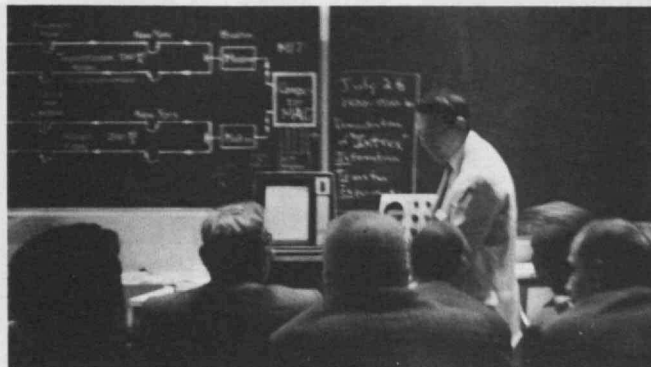
In engineering: "Though computer-aided design will undoubtedly affect the future development of electrical engineers and their technology, we cannot conclude that the next generation of electrical engineers will have to 'know less' since the machine will 'know more.' On the contrary, the forthcoming educational requirements are even more demanding, for in order to make appropriate engineering design decisions, students must know the classical engineering theory of the 'past,' and in order to understand the new programs and be able to innovate in their 'new' environment, they must know the additional mathematics and technology associated with computer structures."—Michael L. Dertouzos, Ph.D.'64, Associate Professor of Electrical Engineering, M.I.T.

In business: "Norbert Wiener (the late Professor of Mathematics at M.I.T.) could not explain how to realize the concepts of cybernetics in organizations, because commercial applications of the computer were unknown in his time. Actually, information and cybernetic systems can be realized to a wide extent by the present generation of large-scale computers, and they are already in practice by some of the large firms of the world."—Bernhard Hartmann, Professor of Management, T.U.B.

In musicology: "Computer-based music research shares problems with other fields in which complex structures that are not well understood are manipulated in order to obtain new insights and useful models. The problem of analyzing and describing a musical pattern may be considered as a fundamental instance: both familiar and unfamiliar patterns may be deceptively simple to



A feature of the M.I.T.-Berlin summer conference on *The Computer in the University* was a telephone connection between the Technical University of Berlin and M.I.T.'s Project MAC and a special input terminal (below) which made it possible for all those at the conference to use the MAC computer facilities. When Gerhard Stoltenberg, the German Minister for Scientific Research, began a problem with MAC, the computer asked him to try again. "Das Kann ich nicht lesen," said MAC.



"Has art any function in a technologized, rationalized world?" asked Herbert W. Franke in the prospectus for an exhibition in connection with the M.I.T.-T.U.B. computer conference this summer. Yes, he answered, "an aesthetic theory based upon natural science . . . is capable of showing new ways for the tradition-bound art world." The exhibition, he said, demonstrated artists' efforts to exploit "new ways of composition" through "conscious application of new materials, means of representation and thought."

Briefly Noted

Super-speed Chemistry

A technique for measuring the quasi-elastic scattering of laser light by salt solutions may make possible analysis of chemical reactions that occur within 10^{-12} second, according to Yin Yeh, '60, of the University of California's Lawrence Radiation Laboratory. The "purity" of laser light is so great that localized fluctuations in the solutions through which it passes result in observable changes in its wavelength, Dr. Yeh told the first Debye Memorial Symposium on Laser Scattering at Cornell University this summer.

Less Management, Less Pay

A National Bureau of Economic Research survey published in midsummer showed that the real personal incomes of top executives in 50 of the largest corporations were no higher than 20 years ago—despite the immense growth of their companies' assets and profits. Commenting on the apparent inconsistency, Daniel M. Holland, M.I.T. Professor of Finance, told *Business Week* that appearances may be deceiving: because of the fragmentation of responsibilities, top corporate executives may be providing less "management" than in 1940.

Penicillin Synthesis

Ajay K. Bose, Sc.D.'50, of Stevens Institute of Technology, reported a total synthesis of penicillin at the Fifth International Symposium on the Chemistry of Natural Products in London this summer which promises to be "a versatile, inexpensive route to new forms of the drug," according to *Chemical and Engineering News*. Most U.S. penicillin production, valued at \$163 million in 1967, now depends on semisynthetic processes based on 1958 work by John C. Sheehan, M.I.T. Professor of Organic Chemistry, according to Arthur D. Little, Inc., Cambridge consulting firm.

A Private Atomic Arsenal?

The atomic bomb is no longer a top-secret weapon. "In theory, I could make an atomic bomb," Michael J. Driscoll, Sc.D.'66, Assistant Professor of Nuclear Engineering, told the Boston *Globe* this summer. Indeed, he said, "any good physicist or nuclear engineer could do it." Uneasy after his interview, Richard W. O'Donnell of the *Globe* wondered if a revolutionary, a criminal, or "an insane physicist of the Strangelove variety" could produce his own private supply. Hence the need, he concluded, for tighter government controls on nuclear materials.

Lower Prices Through Fiscal Responsibility

Gordon F. Bloom, a Senior Lecturer in M.I.T.'s Sloan School of Management and owner of a large Waltham, Mass., food store, told a National Association of Food Chains press conference this summer that food prices, up 2 per cent in the first four months of 1968, will go up another 2 per cent by the end of the year. It's the old story of supply and demand, he said: Our population is rising but production is constant because farmers are finding they can earn more in industry. No one is really to blame; the store's profit margin is low, farmers have more expenses, wages are going up, and only a general policy of "fiscal responsibility" will help lower costs, he told Alan H. Gersten of the Worcester *Telegram*.

the uncritical human observer, whereas a pattern-recognizing program would reveal interesting relations and suggest more effective means of analysis and synthesis."—Allen Forte, former Professor of Music, M.I.T.

In music composition: "At present we are beginning to understand the modulation of computer-generated sounds. This opens the way for the composer to produce scores much more differentiated than he expects from modern instrumental music. The logic procedure of the computer conducts the composer to new principles of working he never expected before. It is possible that a whole new style of music will be created by the influence of the computer."—Fritz Winckel, Professor of Communications Engineering, T.U.B. (An evening demonstration led the newspaper *Donnerstag* to call computer-generated music "captivating.")

In art: "A work of art is not determined by informational rules. Rather the artist, in the sense of game theory, is involved in an interaction with a partner whose pattern of behavior is not completely known. The artist will design strategies aiming at attracting . . . the viewer's attention with as lasting an effect as possible. The computer is an indispensable tool for the analysis of such strategies, as no sufficient model material can be obtained manually."—Herbert W. Franke, a Munich artist.

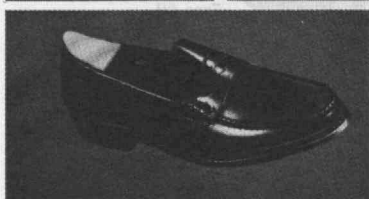
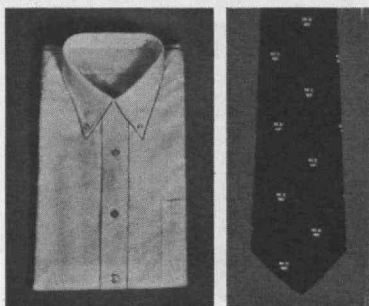
And what of the future? Robert M. Fano, '41, Ford Professor of Engineering who was founder and formerly Director of M.I.T.'s Project MAC, pointed out that "it is far from clear whether the help that computers can provide will be available to individuals as well as to government and private organizations. Knowledge is power," he said, and "the preservation of a reasonable balance of power in society, and therefore of individual freedom, may well depend in the future on whether the services that powerful computer systems can provide will be available to the public as conveniently and economically as telephone service and electric power are available today."



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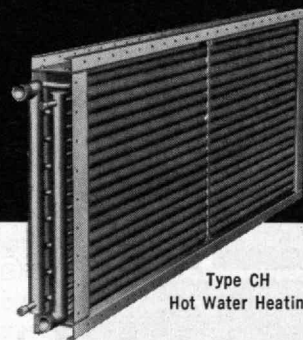
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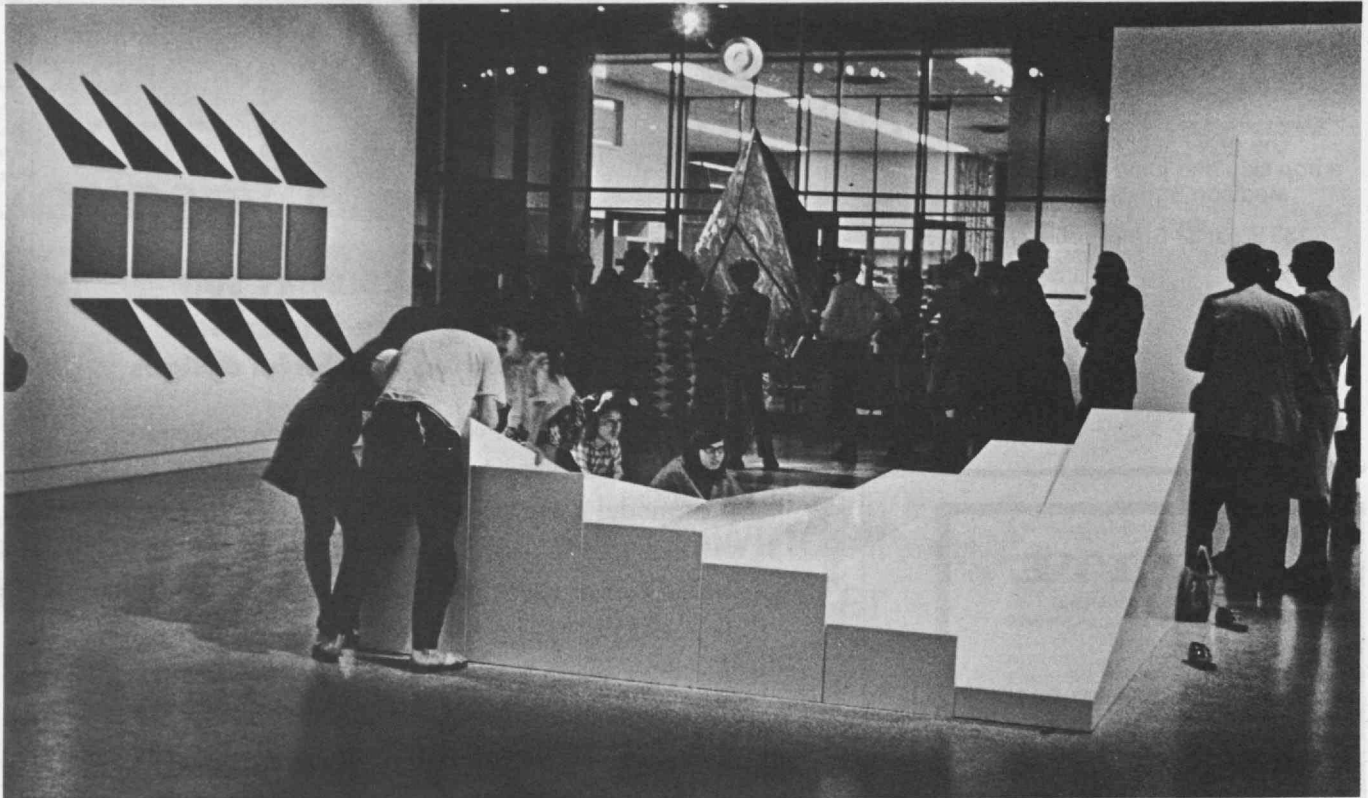
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Park Place: Minimal Art to Turn On a Dialogue

Paintings and sculpture by members of the so-called Park Place Group of New York, assembled into a sprawling collection that at its opening encompassed most of the campus, brought art critics to M.I.T. late in the spring and tourists to the Institute's galleries all summer; it was one of the largest, and surely one of the most controversial, of the many exhibitions ever staged at M.I.T.

Most of the works fell into the category of "minimal"—meaning complete abstraction, a sense of total removal from life and human experience, a converging of scientific, mathematical, and aesthetic ideas. But "minimal" does not refer to size: the show included a 40-foot aluminum sculpture of rods, plates and free-form sheets by David Von Schlegell (acquired during the exhibition by M.I.T.), a 17-

foot welded steel tower painted "traffic yellow" by Peter Forakis and a 16-foot sculpture of steel I-beams and less organized "junk" inscribed "make love, not war" by Mark di Suvero.

Christopher Andreae, writing in the *Christian Science Monitor*, called it "an artistic and educational event of considerable ambitiousness"; he admitted that the quality of the works was mixed but said that "the finest are remarkable." He especially liked two sculptures by Forrest Myers consisting of intersecting triangles and interesting cubes, large enough to be climbed on; a sculpture by Bernard Kirchenbaum in the form of glass-white inclined steps that can be looked at from above; and paintings by Ed Ruda ("impressive scale and precision") and Gay Glading ("the absorption of light and shadow in original and interesting ways"). Tamara Melcher, the daughter of John C. Melcher, '28, contributed two large triangular paintings.

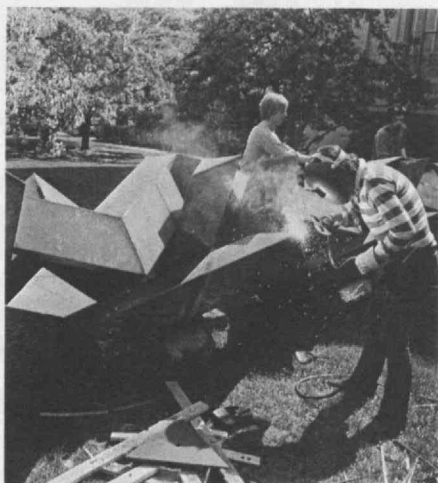
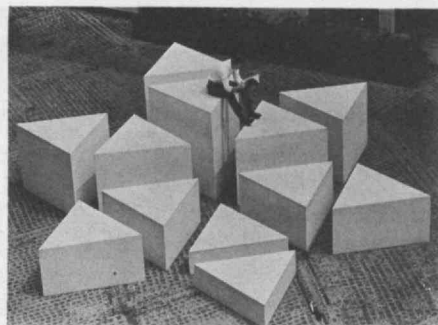
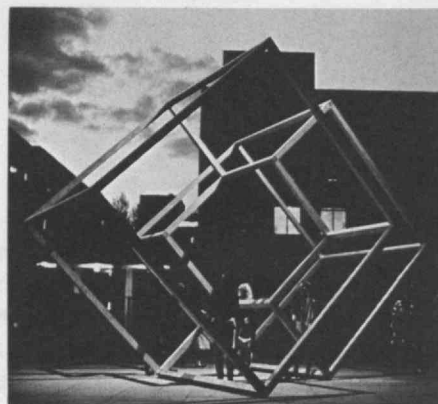
Edgar J. Driscoll, Jr., of the Boston *Globe* noted a "predilection for pure simple forms . . . They are all very cool, smooth, and impersonal," he wrote, "but often most arresting and most pleasing to the eyes."

There was student involvement at several levels. Shortly after the exhibition opening, Mark di Suvero's work of "junk" disappeared from the front of the M.I.T. Student Center. In its place was a neat sign: "Grass and flowers by God; date: the Creation." Some of the sculpture was deposited in front of the office of Wayne V. Andersen, Director of Exhibitions, where it carried a note asking, among other things, "How can the Institute claim that it has no money for renovation of the dorms, while Wayne Andersen has unlimited funds to litter the campus? We strongly feel that the students should have a voice in deciding what kind of junk the Institute puts in our front yard, and will welcome all the support we can muster." Other parts of the sculpture turned up later on the Wellesley campus, having apparently spent a week of "liberation" on the roof of the Phi Beta Epsilon house; to these fragments was attached a note identifying them as part of a valuable piece of art and importuning the finder to "treat it with the care such a paragon of artistic merit deserves."

Earlier, while the exhibition was being assembled at various points throughout M.I.T., a small, neat sign had appeared on the wall near the Hayden Gallery: "Title: 'Wall'; Artist: M.I.T. Physical Plant; Materials: plaster on fire brick; From the Collection of Howard Johnson."

But there was also another side: Joseph Willing, '69, wrote *The Tech* that "there is a mentality which seems to be current on this campus: I don't understand it, therefore I don't like it, therefore it's junk, therefore I don't want to understand it." The exhibit, he wrote, is "honest art. It deserves an honest response, not dismissal as junk. The kinds of questions you should be asking are, 'Why is it exciting? How is it exciting? What does it do as art?'" And Eben Walker, '69, protested that "there is more to art than the 'gut' reactions of 'I like it' or 'I don't like it.'" Said *The Tech* in its lead editorial after the Park Place Group opening, "Part of our education is to become better rounded . . . Professor Andersen and his Committee on Visual Arts deserve much credit for having made us question what art is."

When *The Tech* asked Professor Andersen what he thought of the student criticism, he said that his position was "neutral"; but "I'm turned on by the dialogue," he commented. He stressed that financial support for the exhibitions program comes not from general M.I.T. funds but from gifts given specifically for the purpose.



The opening of the Park Place Group last spring (left) was a gala affair, with people and art interacting in informal as well as formal ways. Included in the show were Forrest Myers' aluminum structure "Untitled" (top), Bernard Kirschenbaum's plywood mock-up for "Spectrum" (center), and Peter Forakis' "Tower of the Lakotas" (above), on the assembly of which the artist was assisted by several M.I.T. students.

Technology for Education

Harvard and M.I.T. are forming a new nonprofit corporation, to be known as the University Information Technology Corporation (UNITEC), to develop and apply new technology in the educational programs of the two institutions. Carl F. J. Overhage, Director of M.I.T.'s Project INTREX on new information technology for libraries, will serve as Executive Director of the new Corporation; Harvard's President Nathan M. Pusey will be its President and M.I.T.'s President Howard W. Johnson its Vice President.

The new Corporation's purpose, said President Johnson in a statement to the M.I.T. faculty, "is to expand collaboration between the two institutions in the sharing of educational and research resources through the developing technology of information transfer." As examples of projects for the Corporation, President Johnson listed closed-circuit television for transmitting lectures and seminars between the two schools; co-operation in educational research, especially on the use of computers, films, and television in teaching; co-ordination of the institutions' computation facilities, including common use of data and program files; and co-operative research on information transfer between the two schools' library systems.

The project has begun with the formation of technical committees from among the faculty of both Harvard and M.I.T. for advising the Corporation and organizing its projects.

In a joint statement, Presidents Pusey and Johnson noted that "the employment of the new information technology in education and research offers great promise for interuniversity collaboration. As near neighbors in Cambridge, with complementary strengths and mutual interests, Harvard and M.I.T. are in an especially favored position to take advantage of the new technology. Its use in the sharing of our resources," they concluded, "offers yet another opportunity of great promise in the strengthening of both institutions."

Business International

When he talks about the international transfer of management skills, does an American businessman really mean the imposition of American standards on a foreign country's cultural and social institutions? Can he mean anything else?

The answer is a matter of degree. "We are supplying an engine to power the foreign economy," said Charles Dennison, Vice President of International Minerals and Chemical Company, at the North American regional seminar of the International Association for Business and Economics Students (A.I.E.S.E.C.) at M.I.T. early this fall, and the economy must somehow be arranged to need the kind of power which is available. But, he admitted, the successful foreign national in an American overseas business "is the one who can depart from his cultural traditions where it is important and fruitful for him to do so."



Carl N. Graf, '51 (top, right), Executive Vice President of W. R. Grace and Company, was among more than 20 speakers at the A.I.E.S.E.C.'s regional conference on the international transfer of management skills. But much of the conference business was accomplished in corridor discussions: "The competition of personalities in management is so engrained in our culture that I think it's hopeless," said Jack Baranson of the International Bank for Reconstruction and Development (above, center).

W. Paul Gullander, President of the National Association of Manufacturers, assured the members of the conference that "the total business system in the U. S. is superior to that in any other country of the world," and this suggests that American methods and standards must appropriately be dominant when American companies attempt to operate overseas. Americans are more aggressive; foreign nationals are less concerned with advancement of themselves and their businesses than with the cultural characteristics in which they operate, said E. S. Groo, Vice President of I.B.M. World Trade Corporation. Indeed, said Jack Baranson of the International Bank for Reconstruction and Development, "the technology gap is incidental to the economic and cultural gap" in most problems of international management.

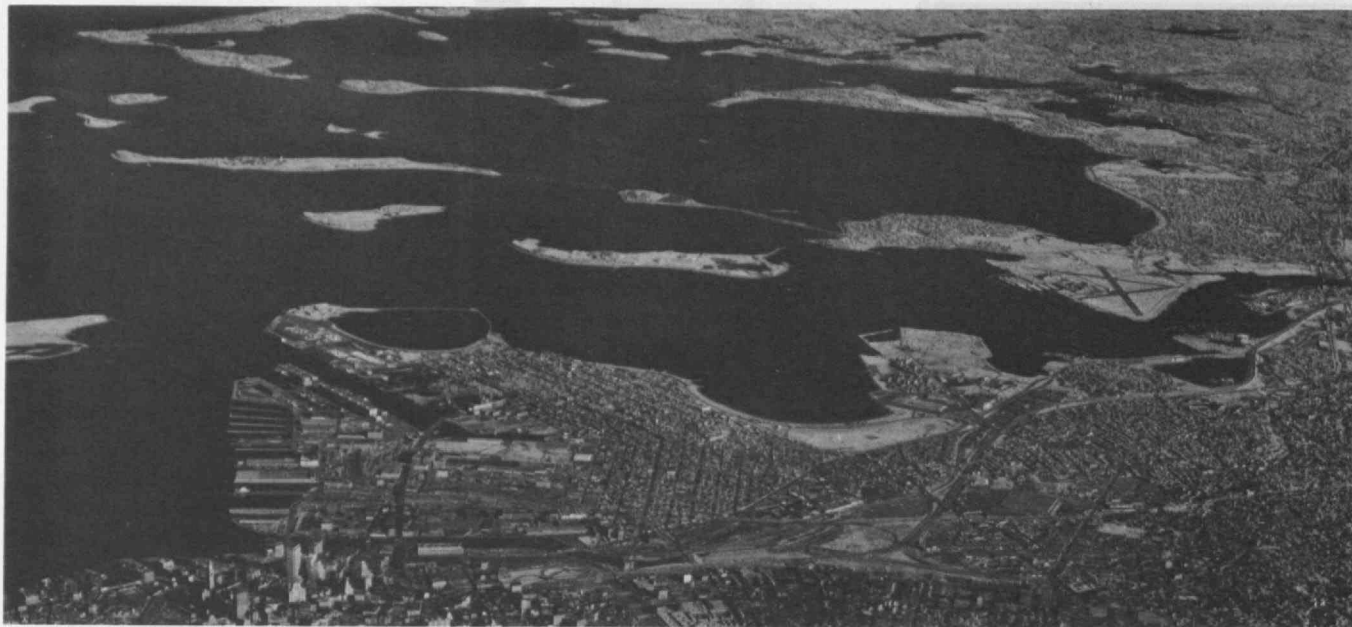
Mr. Dennison admitted that the profit motive tempts many companies to distort their original good intentions for aiding the total national economic development of countries in which they do business. But he cited an example from his own firm's operations—how a new fertilizer plant in India has brought his company into a deep involvement in national agricultural and food policy in relation to farm pricing, farm improvement, and commodity handling. While you are teaching the farmers to use new fertilizers, he said, you can also teach them other skills. "Where does your responsibility end?"

George Cabot Lodge, Professor of Business Administration at the Harvard Business School, agreed that American companies are now facing a "philosophical dilemma" concerning their purposes. There is increasing concern about social and community responsibility both in the U.S. and overseas; "only in the longest view" is maximization of profit a sufficient corporate goal.

In some countries—typically those with little industrial development—there are in fact examples of major corporations becoming instruments of revolutionary change. Sometimes, said Ted Harris of the African-American Institute, this happens with the knowledge and consent of the local government. But a management student from Sierra Leone told Mr. Harris that this was sometimes wishful thinking: often, he said, companies "refuse to communicate effectively with the national government." In his country foreign companies tend to restrict the responsibilities and opportunities of Africans so that "the role which the African really plays is very, very small."

Carroll L. Wilson, '32, Professor of Management at M.I.T., agreed that "there are obligations in addition to royalties which must be fulfilled." Companies which are wholly ex-patriot are "sitting-duck targets" for political animosity; there must be a "harmony of objective" between country and company. There are examples of such developments, he said, and it is encouraging that such successful arrangements are "contagious."

One of the best answers for an international business, said Carl N. Graf, '51, Executive Vice President of W. R. Grace and Company, is to "forget that a person was born here or there," making employees as international as the business for which they work.



Former Mayor John F. Collins, now Visiting Professor of Urban Affairs at M.I.T., says the Boston Harbor Islands are a "magnificent" site for "an entire new city." But conservationists call such plans "a rape of the harbor." (Photo: Aerial Photos of New England)

Whither Boston Harbor?

M.I.T. students surveyed Boston Harbor for new airport sites and as a future transportation hub for two "systems engineering" courses last spring (see *Technology Review*, July/August, 1968, p. 76), and during the summer Robert H. Quinn, the Speaker of the Massachusetts House of Representatives, announced that a team of M.I.T. scientists, engineers, and planners were at work on a \$55,000 in-depth study of the harbor islands' potential.

It is, Mr. Quinn told the *Boston Globe*, "the first time in the history of the Commonwealth that a Cambridge 'brain trust' has crossed the Charles to become part of the legislative process." And the Chairman of the Legislative Study Commission on the subject, Senator John J. Moakley, said "the contract with M.I.T. may be the start of one of the most significant events in this community since the Boston Tea Party."

In midsummer John F. Collins, former Mayor of Boston who is now M.I.T. Visiting Professor of Urban Affairs, told *U.S. News and World Report* that there is a limit on how many people one city can handle, that we are approaching that limit, and that the Harbor is an example, in Boston's case, of our cities' opportunity to build new towns to escape the limitation. "There is a magnificent area lying right off our shore where we may be able to build an entire new city" for at least 200,000 people, he said. "There are harbor islands with nothing on them. There are large areas of undeveloped land. . . . A lot of the land there is not more than six feet deep in water, and the hard rock on which we can build permanent structures is only 30 feet down."

Meanwhile, at a hearing called at the request of the National Wildlife Federation, harbor development plans, specifically those in connection with a possible 1976 World's Fair in Boston, were roundly condemned. "A rape of the harbor," "an abuse of eminent domain," said representatives of boating interests and conservation organizations. Members of the Harbor Islands Study Commission said they would hold further hearings when the M.I.T. study is completed, according to Barry Cadigan, Boating Editor of the *Boston Globe*.

A Student Design To Keep America in Space

Preliminary designs and studies for a national program to send a series of 12 scientific probes swinging by the outer planets—Jupiter, Saturn, Uranus, and Neptune—and into near interstellar space just outside the orbit of Pluto were completed at M.I.T. early in the summer by 26 students in a systems engineering class in the M.I.T. Department of Aeronautics and Astronautics. Their purpose was to have a foretaste of teamwork on a large engineering problem.

They call it Project Galileo, which stands for "Getting A Large Instrument Load out of Earth Orbit." It also recognizes Galileo Galilei, the Seventeenth Century Italian scientist who performed gravity experiments by dropping objects from the Leaning Tower of Pisa. The tower is the project symbol.

The probes would collect data on planetary environments, on the regions between the planets, and on near interstellar space and transmit it back to earth. The average annual cost of \$80 million, say the students, would add immensely to our knowledge of the solar system and would assure continued American superiority in space exploration.

Galileo development would begin now, using available equipment and know-how, particularly that gained with Mariner and Ranger probes to the moon, Venus and Mars. The program would capitalize on planetary swing-by, so that the 1000-pound probes would loop through the gravity fields of one or more of the outer planets, and, by virtue of the gravitational encounters, soak up added energy and thus gain enough velocity to escape the solar system. The most significant advance needed for Galileo is improvement in equipment reliability over long periods of time.

The students computed 12 occasions—launch windows—during the 1972-1980 period when one or more of the outer planets would be in position to permit swing-by from the earth. A typical mission would require up to 10 years, but data would continue flowing back until as late as 1990.

Though the probes would not be identical, each has the form of an hexagonal wheel five feet across and 18 inches high. The wheel is divided into compartments to hold the power supply, the on-board guidance and control system, and densely-packaged computer and central data processor, communications systems, and the equipment for scientific data gathering. A 30-pound-thrust solid-reaction jet engine is included for mid-course trajectory changes.

Power would be supplied by a radioisotope thermoelectric generator (RTG) fueled with plutonium-238. Its design output is 340 watts over a 10-year period.

Communications designed by the students are unique. First, the students found that because of the enormous distances, the optimum

radio frequency would have to be in the microwave spectrum, around 2300 megacycles. This led to a design that calls for solid state circuitry and microwave generating and modulating equipment for transmitter-receivers. The system is designed to operate on 20 watts input, and this low power input dictated, in turn, the design of a large dishlike antenna that could focus the transmitted signals and make maximum use of the signal strength.

The student solution to the antenna design problem is a deployable dish, 20 feet across when deployed, which is folded around the body of the spacecraft at launch. A small secondary reflector is supported on a tripod jutting upward from the wheel to illuminate the main dish. In space, the dish opens on command and the vehicle control system keeps it pointing earthward at all times.

Galileo guidance and control is achieved by combining radio data from earth with automatic on-board systems—both a star-sun tracker and an inertial system using gyroscopes and accelerometers. The on-board computer is patterned after one designed at M.I.T.'s Instrumentation Laboratory for Apollo astronauts. One of its many chores is to integrate radio, celestial and inertial data and command trajectory and attitude changes to achieve a pre-programmed mission profile.

Scientific experiments proposed for Galileo include equipment to measure strength and direction of planetary magnetic fields during swing-bys, devices to measure charged particles trapped in planetary magnetic fields or flowing outward from the sun through interplanetary space, ionization chambers, cosmic ray telescopes, TV cameras, spectrometers, and micrometeoroid detectors. The latter would be most useful in the asteroid region between Mars and Jupiter. The students designed a unique multiple-plate shield to protect the probes from damage while passing through the asteroid belt.

Paul E. Sandorff, '39, Visiting Professor of Aeronautics and Astronautics, was in charge of the course. Student teams from the course worked on orbits, trajectories and launch windows; boosters and the mid-course engine; scientific instruments; guidance, control and the computer-central processor; microwave radio and deployable antenna; and generator. Two graduate and two undergraduate students were responsible for over-all design integration.

Briefly Noted

For Engineering and Medicine: M.I.T. is among several institutions seeking new ways of making modern technology useful for biomedical research and health care under subcontracts from the National Academy of Engineering. In co-operation with Harvard Medical School, M.I.T. will try to relate "university activities in engineering to the physical, biological, medical, and management sciences."

Leading in R & D: A survey by Heidrick and Struggles, Chicago-based management consulting firm, shows that 4.5 per cent of the nation's research and development chiefs hold M.I.T. undergraduate degrees and 9 per cent have M.I.T. graduate degrees—the largest share (in both categories) of any university. Runner-up is the University of Illinois (3.2 and 6.6 per cent). Most research and development executives studied chemistry; 43.8 per cent hold doctorate degrees in that field, 12.5 per cent in engineering.

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It Takes a Little Pull to Get Ahead



Electric cars may have had as much publicity in the last two months as they have had in the last half century. But what started out as a plan by Caltech's Wally Rippel to advertise the many virtues of pollution-free vehicles, "The Great Electric Car Race" ended by proving painfully and publicly just how far off may be the real heyday of the commercial electric car.

It all began when M.I.T. bravely accepted a challenge from Mr. Rippel, a senior physics major (who had been perfecting his electric vehicle for two years), to beat him in a cross-country race by building its own experimental electric car. But the shame of being second on the draw was not great; after all, M.I.T.'s car was the only one ever built with its own monitoring devices to oversee the electric systems. It was the first to carry its own weight again in sophisticated Gulton batteries, which are usually reserved for space use, let alone its weight in ice. And so that episode in Pasadena, when the 1968 white Corvair was towed across the finish line after sputtering and sparking its erratic way from Cambridge with an "I think I can, I think I can" heroism, was, after all, a not-so-humiliating defeat.

"Quite literally no progress has been made in developing a commercial electric car since the first electric cars were built 50 years ago," says Richard D. Thornton, Sc.D.'56, Associate Professor of Electrical Engineering, whom the interested M.I.T. students requested as their mentor. The M.I.T. car was planned, from start to finish, as an experiment.

Volts and Bolts

Mr. Rippel installed his motor in a Volkswagen microbus (he called it a "Volkswagen"), a model also considered, at one stage, by M.I.T. who later chose a more streamlined Corvair. But, while the Caltech physics major left the body of the bus intact for his 45 m.p.h. travel speed, the M.I.T. team decided to add some improvements to the General Motors version. They claimed that their modifications made the car aerodynamically more sound for cruising at 60 m.p.h. No one has heard—yet—what General Motors thinks.

The original M.I.T. design (see Tech-

nology Review, July/August, 1968, p. 74) called for a special sheet metal and fiber glass body to be mounted on a 1968 Corvette frame with two 60-pound permanent-magnet motors mounted in each rear wheel and controlled through high-speed, high-power switching transistors and silicon-controlled rectifiers. But there were disappointments; the more sophisticated designs the students wanted to use "simply were not ready," says Leon Loeb, '70, an M.I.T. mechanical engineering major who co-ordinated the student team. So M.I.T. ended up by using its backup systems in the race: the Corvair, powered by a single engine from the Baker Division of Otis Elevator Company (the same manufacturer who made engines for the Bakers of pre-World War I vintage), nickel-cadmium batteries designed by Gulton Industries, Inc., and an S.C.R. phase-controlled charger.

"What If We Lose?"

All spring there were faculty and students who couldn't believe the race was really to take place, says Mr. Loeb. "You're going to do what?" was a frequent reaction, he said. Or, "You mean to say M.I.T.'s name will be used on the car?" "What if we lose?"

Finally, after a semester's persuasive work on technical problems connected with building both principal and backup systems, even the skeptics began to believe it could happen. But the weekend before, the student team took its turn doubting.

A test run to Lee, Mass., projected to take eight hours the Friday before the planned start on Monday, August 19 (actually the race began on August 26), took the "finished" M.I.T. car 14 hours. It was the car's first road test in which the power demand was great enough to reveal the extent of the battery cooling problems.

As a result, there was a negotiated delay in the starting time while the students raised the upper bank of batteries to permit air cooling between the two layers, and they installed a water-cooling system around the motor. Nonetheless, during the first lap of the race, the system overheated. Finally ice packs had to be applied to the batteries, and the rest of



The Great Race started on August 26 at M.I.T. under bright sunshine, before a sizable crowd, and to the tone of a cross-country countdown (below) by Leon Loeb, '70, M.I.T. student coordinator.

East to West, the M.I.T. part of the race consisted alternately of being towed to charging stations (upper left), breezy highway sprints at 60 m.p.h. (lower left, photo by David Laing, '70), and a pains-

taking repair of the car, here by Charles W. Kaminski, '70 (lower right). Finally West met East when Caltech's driver Wally Rippel was greeted by M.I.T. President Howard W. Johnson (upper right).

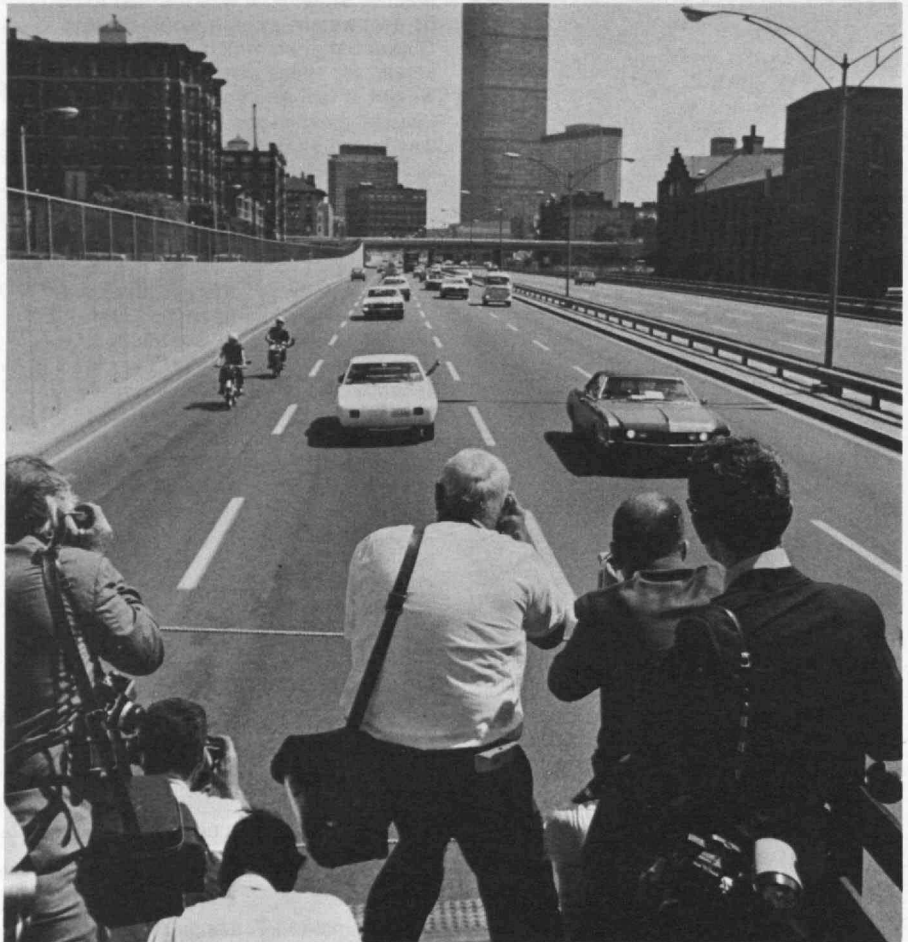
the trip "was like driving an iceberg," says driver James Martin, '70.

The need for a good cooling system is the most important technical lesson of the race, Dr. Thornton says. "But if this problem can be solved, along with that of producing the right battery with a high-energy storage capacity, a commercial electric vehicle is probably five to 10 years off. Within that period we expect to see improvement of present battery systems by a factor of three; and if only 1 per cent of the cars on the road in 1980 are electric—even that amount would represent a significant foot in the door."

Another lesson which emerged as the car alternately leaped and pattered across the country—to earn itself the epithet, "Hare"—was the need for good speed controls. "We got an education in engineering as a bonus for the most rewarding experience in a student's lifetime," said Charles Kaminski, '70, one of the M.I.T. drivers. Meanwhile, Wally Rippel's eventual victory proved that the tortoise is always with us.

"An important effect, I feel, is a narrowing and even a complete demolition of the generation gap," commented Mr. Rippel at a press conference after he arrived. M.I.T.'s Dean of Engineering, Gordon S. Brown, '31, interpreted the Caltech physics major's experience as closing the interdepartmental gap. "You've done a lot to prove that engineers and physicists can work together."

More specifically, the "Great Electric Car Race" will definitely produce a few undergraduate theses. Some of the team members, although juniors, have their topics worked out already. And the Project Laboratory activities, begun under Dr. Thornton to see the electric car to the starting line, will continue long after the finish. The student team hopes to stay together. They will exhibit their car, with the original, prototype motor at the Northeastern Electronics Research and Engineering Meeting (N.E.R.E.M.), opening in Boston on November 7. They hope to get another car built by next summer. But who knows if Wally Rippel will dare again. Next August, M.I.T. may be the world's first technological institute competing in the *Grand Prix*.



The Great White Egg



The week of August 26 found most Americans witness to a rise and most brutal fall of student protest at the gates of the Democratic Convention. Less advertised, but more heartening, was The Race, an impressive student victory. If not a victory, in fact, for M.I.T., it was indeed a triumph of youth over mass-media misrepresentation and the conservative establishment compared with the news media's tales of rebellious students, draft dodgers, pot and pill pushers, this example of useful exuberance and determination was a refreshing change.

The formula: A challenge from Caltech x (student power)ⁿ = TECH I (The Electric Car Hack). The students brought to the challenge a variety of interests; there was the racing buff, the pre-medical student, the student with an electric bicycle, the mechanical engineer with a gift for public relations, and the grad student who was interested in the theory of electric propulsion but had yet to apply for a driver's license.

This package of student power housed in a Vassar Street garage became a cohesive force inhaling electrical components, ignoring bikini-clad classmates, and committing M.I.T. to nationwide electric car publicity for better or worse. Thus emerged at 11:45 a.m., August 26, out of sheer determination, The Great White Egg.

Resilience was another secret weapon. A catastrophe just whetted the students' appetite and their creative ingenuity. Batteries not charging to capacity? Give them a super zap! Batteries overheating while being recharged? Cool it—with ice cubes! Water pump clogged with floating debris in the bilge? Use a silk stocking generously donated by the judge's wife.

Fatigue never brought out the pettiness of small people, the selfishness of the unsure. Victories and failures were shared (Wally Rippel's were subtly cheered) and throughout ran the touch of dry humor, shared for instance, over a light breakfast of "juice, milk, coffee, two eggs, bacon, sausage, toast, and, oh yes, a porterhouse steak please!"

On asking the whereabouts of driver Jim

Martin as we left Tulsa, we were informed that he had locked himself in the ice machine, mistaking it for the electric car.

Previous radio telephone communication had warned TECH I of a possible peril as a wirehaired terrier was crossing the highway!

Norm Marx found it shocking, the amount of water in the front of the car. Yes, shocking, especially while an overheated three-phase 208 volt cable was sparking its way across the grass like a string of Chinese firecrackers.

Such was the way we talked our way around those unpredictable moments. Talking our way around St. Louis was even more amusing. In the fury of a fast take-off many of us crossed the Mississippi three times before regrouping again.

Standing by to recharge, being peered at by reporters, fans, and generally innocent bystanders, the boys patiently, sincerely answered the deluge of questions and suggestions, such as the frequent, "Why don't you connect a generator to the front wheels to recharge the batteries as you go? (We're holding a contest for the best answer to the question!) Their comebacks were often blasé: "Would you mind not taking a flash picture until I am through recharging the batteries? The last blue flash I saw . . ."

Mrs. Richard D. Thornton, wife of the faculty adviser to the M.I.T. race team, accompanied her husband and the team on the cross country race. She volunteered the above account because, she explained, she felt too much publicity had been given to "spark plugs and ice cubes" during the race, and not enough attention had gone to the students themselves.

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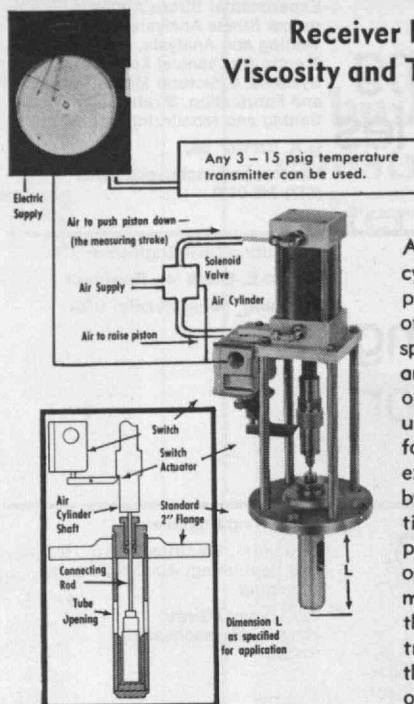
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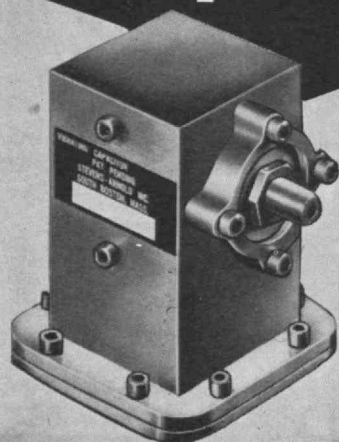
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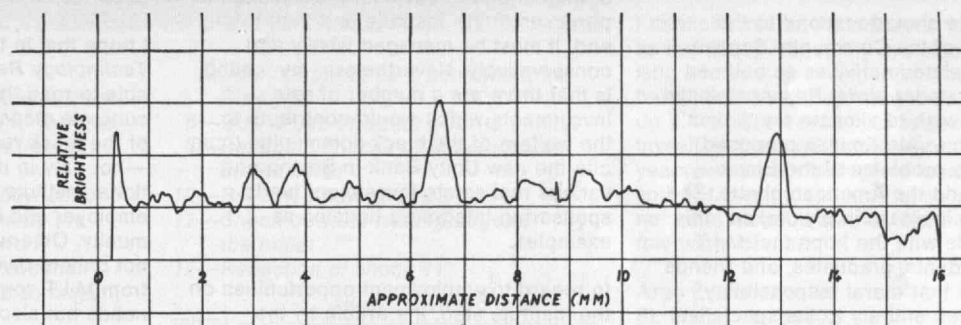
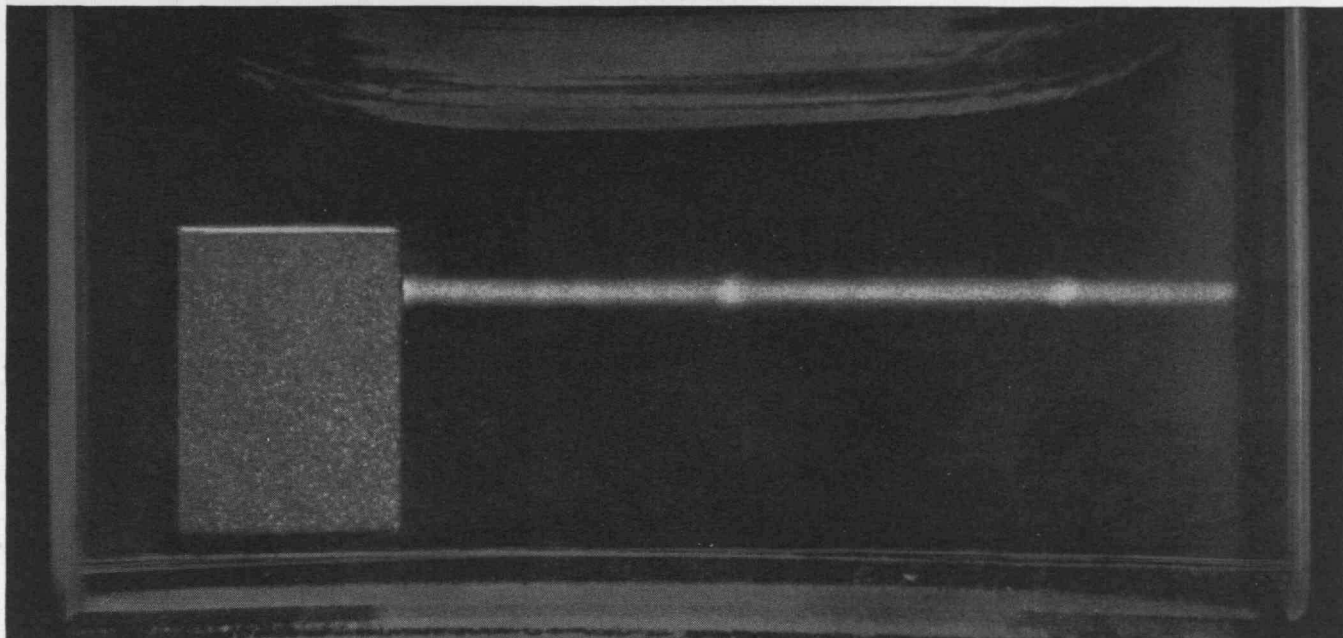
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The photograph above, like the first of its kind, was taken by scientists at Bell Telephone Laboratories. The three bright spots along the horizontal line are images produced by a train of laser pulses, each about 2 picoseconds (2×10^{-12} sec.) long, caught in transit through a fluorescent liquid. This technique allowed us to display and measure these light pulses, the briefest optical phenomena ever observed. In this liquid, light travels 0.4 mm in 2 picoseconds.

The curve, a densitometer tracing of the photograph, is the pulse-brightness profile. From it, we have been able to study the pulse width, the approximate number of pulses in the train, and the peak pulse power, none of which could previously be examined from measurements on a single train. The laser used here, for instance, has an instantaneous peak power of about 1×10^9 watts.

This is not high-speed photography.

Rather, a stationary image is formed in the cell holding the fluorescent liquid. This fluorescent image can be easily seen by an observer. In the photograph above, the pulse train enters from the right and strikes the mirror (left) submerged in the liquid. Each pulse, returning after reflection, collides with every following pulse in turn.

This interaction of pulses produces bright spots because the liquid's fluorescence is excited by the combined energy of the colliding photons. So, because more energy is concentrated at the collision points, bright spots appear... with a weaker background track marking the remainder of the pulses' path. The laser pulse, in effect, takes its own portrait. The camera shutter is held open throughout.

This research was performed at Bell Laboratories by J. A. Giordmaine, P. M. Rentzepis, S. L. Shapiro, and K. W. Wecht. In a group of related experiments

by Rentzepis and M. A. Duguay, using a second train of pulses moving at slightly different speed, a display of the pulses expanded by a factor of 50 has been produced. Or, by controlling the energies and wavelengths of two successive pulses—so that neither alone can excite the medium—they have been able to eliminate the background track in the photo. This makes the spots stand out more brightly.

These new techniques for the direct measurement of ultra-short light pulses will allow us to observe laser light on a picosecond time scale and obtain a better understanding of the mechanism of laser action. Ultimately, this knowledge may contribute to improved communications technology for use by the Bell System.



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Correspondence Review

Moral Responsibility

To the Editor:

I was greatly interested in the June issue of *Technology Review*, particularly the items inspired by the assassination of Dr. Martin Luther King, Jr. (pp. 62 ff.).

Perhaps *The Tech's* appraisal is true, but I consider it essential that scientists not only realize but also respond adequately to the importance of social values. As one of the infinitesimal group of Negro graduates, and not a wealthy one, my token giving to M.I.T. is much more important in "the percentage of the class contributing" than in the amount.

The Institute should respond to the importance of the Community Service Fund and related activities as outlined on page 64 under Moral Responsibility. However, I wish to allocate my "token" contribution to Mr. Smith's proposed chair on the problems of the Black American and the American ghetto. The percentage increase in my "token" this year is made with the hope that M.I.T. and its residents, graduates, and friends may realize that moral responsibility cannot be left entirely to the specialists and that science, if it continues to be isolated from moral and civic responsibility, will surely bring disaster.

Edward S. Hope, '26
Washington, D.C. 20020

Institutional Responsibility

To the Editor:

Over the years a sizable fraction of my very modest charitable contributions has gone to M.I.T. For some time I have had the feeling that these donations might more appropriately go to civil rights organizations where the need is more immediate. Nevertheless I have continued to contribute to M.I.T., both because I feel deeply indebted to the Institute for my own education and because I feel that M.I.T. plays a major part in the scientific and technological growth of the country.

But since the assassination of Martin Luther King, Jr., it has occurred to me that I would be happier about continued contributions to the Institute if I felt these

contributions were doing double duty in some sense.

The questions uppermost in my mind are in regard to the Institute's enrollment policies, its employment policies and its use of its investment funds. The first two of these questions were answered in the June issue of *Technology Review* (pp. 62 ff.), in which information was given which clearly indicates that black people are underrepresented both in the student body and on the staff. Let me touch briefly on the three questions.

M.I.T. has a very sizable investment fund. I realize that the primary purpose of this fund is to advance the educational purposes of the Institute and that, to this end, it must be managed wisely and conservatively. Nevertheless, my feeling is that there are a number of safe investments which would contribute to the welfare of the black community. I can cite the new Unity Bank in Boston and various real estate investment funds sponsoring integrated housing as examples.

In regard to employment opportunities on the Institute staff, the article by the former President of K.L.H., Henry M. Morgan, '48 ("*One Company's Experience in Creating Employment Opportunities*"), in *Technology Review* for June (pp. 30 ff.) shows just how much can be accomplished in this area. A simple step which suggests itself is for M.I.T. to place all its help wanted ads in the *Bay State Banner* rather than in the general circulation dailies.

As far as student enrollment is concerned, it seems to me that although M.I.T. may be working hard on this problem, it may not be working as hard as possible. I recall that shortly after Dr. King's assassination a number of universities in the Boston area made public commitments to increase their black enrollment by definite and sizable numbers. It would have been nice to read that M.I.T. had done the same thing. I feel sure that if a public announcement had been made, the Institute would have been able to conceive of the necessary modifications in admission procedures, pre-enrollment special classes, and reduced academic load which might be

necessary for successfully carrying out the commitment.

I do not feel that faculty contributions to a community service fund, or student involvement in social work, relieves the Institute of its corporate responsibilities in this matter. Also, the relevance of the program on urban affairs to the needs of the black community would need considerable clarification before I would accept this as profound evidence of M.I.T.'s concern with the problem. Cambridge residents, whose homes may be taken for the Inner Belt in order that M.I.T. not be disrupted, may well feel that M.I.T.'s concern for urban affairs is on a rather abstract level.

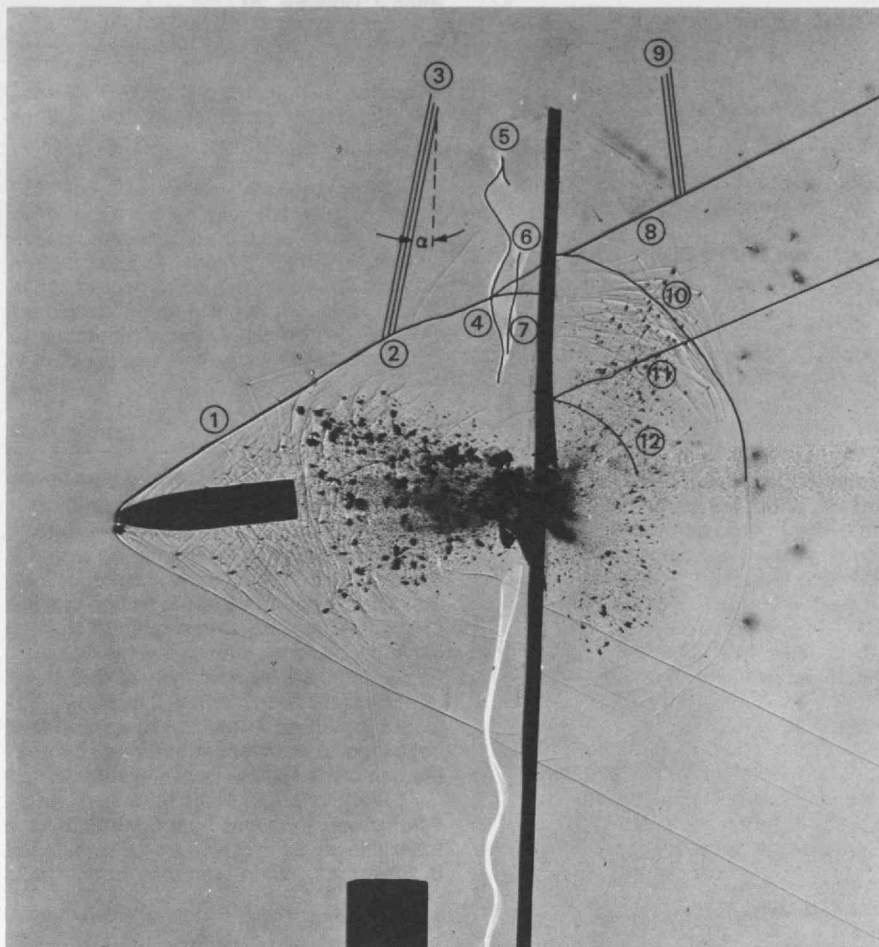
I hope that in the first few issues of *Technology Review* this fall I shall be able to read that M.I.T. is making many concrete steps to improve the situation of the black residents of the Boston area—not only in its capacity as an educational institute but also as investor, employer and inhabitant of the community. Otherwise, I shall feel called on not only to divert my own contributions from M.I.T. to more pressing community needs but also to persuade as many other alumni as possible to do the same.

John N. Pierce, '54
Lexington, Mass. 02173

Rarefaction or Reflection?

To the Editor:

When we first examined "Strobe Probe" in *Technology Review* for July/August (p. 87), we concluded that Professor Edgerton scored only 50 per cent on the answers to the mystery photograph, because the white, ghost-like exposure at the left of the Plexiglas is a rarefaction wave. On further examination of a print of the shadowgraph photo, however, we conclude that he was correct in stating that the white wave is an optical reflection. The problem arose out of the apparent interaction of the white wave and the bow shock (number 4 on the overlay). It is quite obvious from Professor Edgerton's print that the white wave and the splitting of the bow shock do not coincide at the bottom of the photo. We have resolved this interaction to be a coalescing of the spherical bow



- 1—Bow shock of bullet
- 2—Interaction of bow shock with transmitted impact shock from Plexiglas
- 3—Transmitted shocks from impact of bullet with Plexiglas
- 4—Apparent interaction of bow shock with mystery wave—actually the coalescing of waves 6 and 7
- 5—Mystery wave—optical reflection
- 6—Transmitted bow shock 8 through Plexiglas
- 7—Spherical shock wave originating

shock of the bullet after it has penetrated the Plexiglas and the transmitted bow shock. The superposition of the optical reflection on this interaction was purely coincidental.

Donald D. Colosimo, '62
John A. Lordi, '60
Buffalo, N.Y. 14221

The authors are associated with the Cornell Aeronautical Laboratory.—Ed.

Emotion, Love, and Compassion

To the Editor:

Your reporting of recent ceremonies in tribute to Robert F. Kennedy (*Technology Review* for July/August, p. 64) in my opinion has breathed life into M.I.T.'s coldness. At times it has appeared to me that M.I.T. is afraid of emotion, love, brotherly compassion, and even human compassion. I feel that this starts in the manner in which freshman classes

- from the bullet as it penetrates the Plexiglas
- 8—Bow shock of bullet prior to impact
- 9—Reflected shocks of bullet impact on Plexiglas
- 10—Reflected bow shock 8
- 11—Shock of blunt trailing edge of the bullet
- 12—Reflection of shock 11

$$\tan^{-1} \alpha = \frac{\text{speed of sound in air}}{\text{speed of sound in Plexiglass}}$$

are handled and "thrown at" the students. I thank you for honoring the late Senator.

William P. Reynolds, '49
Canton, Mass.

Objectivity and Judgment

To the Editor:

I recently returned from a long and pleasant vacation which caused me to fall behind in my reading and have just caught up with the March, 1968, *Review*.

I was more than a little shocked to read of the "honors" being heaped upon Noam A. Chomsky by the student publication *Innisfree* (*Technology Review*, Mar., p. 61). Certainly Dr. Chomsky has a perfect right to his opinion on any subject in our free society, but why an individual who shows so little regard for our laws that he is "indictable on charges from tax evasion to conspiracy" is so

"honored," is beyond my understanding. I also wonder, if he is indictable under these serious charges, why he has not been indicted and brought to trial. Most citizens who are accused of income tax evasion are, in fact, indicted and brought to trial. Why is Dr. Chomsky untouchable in this respect?

The comments reported in which he allegedly stated that "the United States Government is guilty of crimes greater than those perpetrated by the Japanese and on a par with the actions of the German Nazis" are, to say the least, intemperate. To say the actions of the United States Government in that sphere are comparable to the slaughter of some six million humans by the Nazis shows a lack of objectivity and judgment hardly in keeping with a professor at M.I.T.

I do not doubt that Dr. Chomsky is an excellent scholar and I have heard from various sources of his expertise in his field of linguistics; however, his knowledge in his own field doesn't make a scholar or an authority in fields far removed from his specialty. Unfortunately, in my opinion, a few scientists, who are undoubtedly authorities in their chosen fields, seem in recent years to set themselves up as a "law unto themselves." On some occasions their advice to break laws with which they do not agree seems to lead only to anarchy and a breakdown of an orderly society.

I cannot criticize the students too greatly as the young frequently are most idealistic and wish to change the world for the better and think they know exactly how to do it. Perhaps I once had such ideas myself, but generally it takes only a few years away from college to learn that some of these ideas are not so clever, or not quite as good as they seemed a few years earlier.

Argo E. Landau, '26
St. Louis, Mo. 63102

Dr. Faustus—M.I.T. Version

To the Editor:

The following little piece has grown out of teaching Goethe's *Faust* to M.I.T. students, and it occurs to me that it may be suitable for printing in *Technology Review*.

Mephistopheles:

"Why on Earth
Are you brooding in Heaven?"

Faust:

"What the Hell
Are you brewing on Earth?"

The Lord:

"Stop raising Hell,
Mephisto,
Get down to Earth
mein Fausto,
For Heaven's sake."

Martin Dyck
Cambridge, Mass. 02139

The writer is Professor of German and Humanities at M.I.T.—Ed.

Puzzle Corner

Allan J. Gottlieb, '67

Hi (again). After a summer "off" (40-hours-a-week job in industry) I'm ready to start work. I tell my colleagues at Grumman that working there is my vacation. This, of course, is greatly received. After completing his doctoral program at Brandeis, your editor will have to find permanent work. Does *Newsweek* need a puzzle column?

Last spring at the end of the term I received a master's from Brandeis. What a nice looking diploma—it wasn't even folded! When President Johnson handed me the S.B. and I noticed the crease down the center, my mind was blown. By the way, the fold loses none of its charm after a year behind glass.

One M.I.T. tradition I really appreciate is Ashdown House. If you think orchids are hard to find in a desert, try to locate an apartment in Waltham. After two days all I have to show for my efforts is a near miss and two bald tires.

In order to acquaint the "rookie" readers and refresh the memories of veterans, let me go over the ground rules:

1. The problems which appear are those you send in. The scheduling algorithm is rather complex but neatness does count heavily.
2. Answers to all but speed problems appear in the third following issue. When submitting solutions, please indicate which problem (by number) you are trying to solve. The problems within a given volume are numbered consecutively from issue to issue.
3. Our printer is Arabic, not Greek.
4. If you disagree with any solution (or editorial comment), submit your grievances in writing.
5. All correspondence should be addressed to Allan J. Gottlieb, Department of Mathematics, Brandeis University, Waltham, Mass., 02154.

Problems

This letter was mailed by James L. Manganaro, '61, Assistant Professor of Chemical Engineering at Manhattan College:

1. Here is an interesting geometrical problem which resulted from a study

of solid waste disposal. [Is this a sly comment about the usual material I print?—Ed.] Given an arbitrary triangle, find (by geometrical construction) the point such that the sum of the distances to the three vertices is a minimum.

2 P. W. Parsons would like all integral solutions to

$$x^2 - 8xy - 2y^2 - 6x + 1 = 0.$$
 (Perhaps none exists.)

Here's one Douglas J. Hoylman, '64, found in Knopp's *Infinite Series*:

3 Consider the series

$$\sum_{n=1}^{\infty} \sin(n! \pi x).$$

a Show that it converges when x is rational. (Easy.)

b Show that it converges when $x = e$. (Tough.)

c Find a value of x for which the series diverges. (Not too bad once you've done b.)

This problem from Thomas M. Cover, '60, Associate Professor at Stanford University, should make us all rich. He writes: "During the history of gambling there have appeared many famous gambling systems. These include martingale systems (doubling up) and paroli systems. All seem to have in common the accumulation, with high probability, of a small amount of capital at the expense of a small probability of a large loss. This original problem shows that any 'reasonable' distribution on the gambler's terminal capital may be achieved. All of the previously known gambling systems on fair binary events are encompassed in this problem. Solution of the problem follows by simple induction.

4 Consider a sequential gambling system on sequences of Heads and Tails in which the bet at each stage may depend only on the outcomes of the previous events. The gambler has an initial capital w and may never bet more than he currently has. Given capital a after k trials, the gambler may bet any amount b , $0 \leq b \leq a$, on either Heads or Tails, and the gambler's fortune at the next stage will then be $a + b$ or $a - b$ accordingly as the $k + 1$ st event is

correctly guessed or not. There are 2^n possible sequences of Heads and Tails of length n . Let w_1, w_2, \dots, w_{2^n} be the corresponding terminal fortunes (for a given betting scheme). Suppose that a sequence of n bets is to be made. Show that there exists a sequential gambling system on n trials achieving w_1, w_2, \dots, w_{2^n} if and only if $w_i \geq 0$, all i , and $(1/2)^n \sum w_i = w$. Thus, subject to the above rather obvious constraints, every terminal distribution on the gambler's fortune is achievable.

5 For obvious reasons I am printing this letter exactly as received from Donald B. Silverman, '60, in reference to SD 12:

86 Blodgett Avenue
 Swampscott, Mass., 01907
 April 29, 1968

Mr. Allan J. Gottlieb
 Department of Mathematics
 Brandeis University
 Waltham, Mass., 02154

DGHGJ CTPSC TLGHQ TPLIF MQFDE
 PHVMC IETLP PDTQR HORHA HQRTF
 NLXQH SOXJQ MPQHN GHVJC
 DQMOT ILPPQ HJIBP

The cryptogram by A Non Plus was quite easy to solve; not much time wasted there. What was annoying was to decode and get the tripe that passes for eloquence. Since you are a mathematician I hope that you cannot resist a puzzle. My revenge on you is above. Not as easy a cryptogram as yours but not exceptionally difficult. All you need is the key, which is in this letter.

D. B. Silverman

I've checked for typo errors; found none; refuse to be responsible if there are any.—DBS

Speed Department

I received the following suggestion from Reino W. Hakala:

SDI You might ask your readers to multiply 142857 by 2, 3, 4, 5, and 6 and ask them to predict from these products what the product with 7 would be. Once they find out what the correct product is,

they should explain the reason for the observed behavior.

John W. Colton, '48, asking "How about another oldie?" makes the following contribution:

SD2 Suppose we have a hopper which is $10' \times 10'$ in plan view (its height doesn't matter). The bottom of this hopper is four triangular planes pitched at 45° to the horizontal. Within 30 seconds, without using paper, slide rule or computer, tell me what the solid angle is between any two adjacent bottom bottom plates.

Solutions

35 Given the drawing below in which it is known that triangle XYZ is equilateral and in which it can be shown that angle BZX is $\alpha + \pi/3$. Show that its sides are of length $8R \sin \alpha \sin \beta \sin \gamma$, where R is the perimeter of triangle ABC.

Since this is a geometrical problem, Mark H. Yu, '70, solved it; but he notes that R is given incorrectly as the perimeter of triangle ABC; it should be the circumradius. [Sorry.—Ed.]

Apply the law of sines to triangle BXC; we obtain

$$\overline{BX} = [\sin \gamma / \sin (\beta + \gamma)]$$

$$\overline{BC} = [\sin \gamma / \sin (\pi/3 - \alpha)] \overline{BC}.$$

$$\text{Also, } \overline{XZ} = [(\sin \beta) \overline{BX}] / \sin (\alpha + \pi/3) =$$

$$[(\sin \beta \sin \gamma) \overline{BC}] / [\sin (\pi/3 + \alpha)]$$

$$\sin (\pi/3 - \alpha) = [\sin \alpha \sin \beta \sin \gamma] /$$

$$[\sin \alpha (3 \cos^2 \alpha/4 - \sin^2 \alpha/4)] =$$

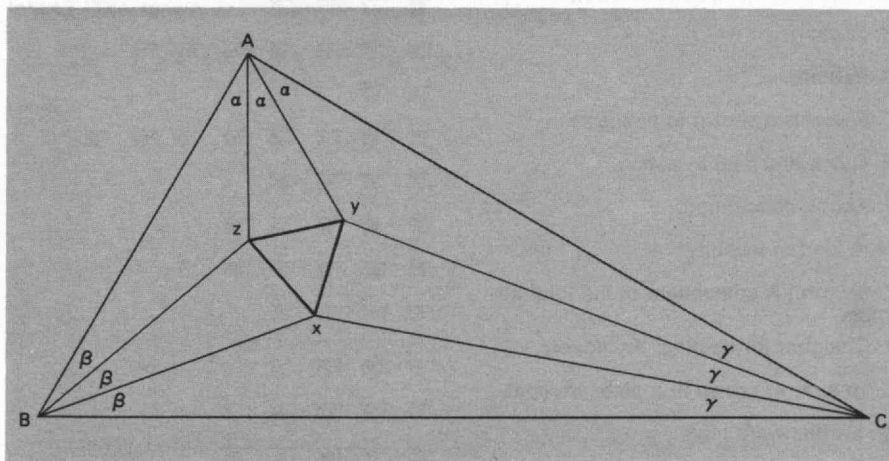
$$[8 (\sin \alpha \sin \beta \sin \gamma) \overline{BC}] / 2 \sin 3\alpha.$$

But $R = (\overline{BC}) / 2 \sin 3\alpha$ (just check any geometry textbook). Q.E.D.

Also solved by the proposer, Eric Rosenthal, son of Meyer S. Rosenthal, '47.

36 A quadrilateral is inscribed in a circle such that one side is a diameter of the circle and the other three sides have lengths 1, 2 and 3, respectively (above, right). Find the length of the diameter to three decimal places.

The following from Richard G. Lipes, '64, uses enough calculus even for the proposer, Doug Hoylman:



Calculus in the form of Newton's method is applied:

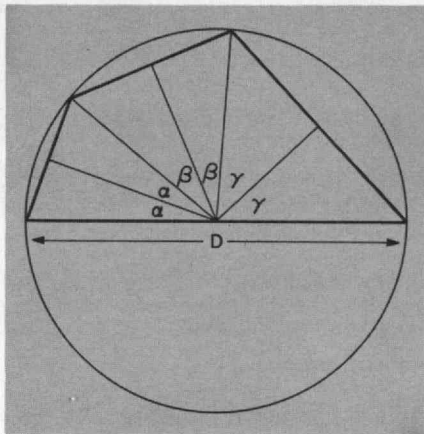
$$\sin \alpha = 1/D, \sin \beta = 2/D, \text{ and } \sin \gamma = 3/D, \text{ so } \alpha + \beta + \gamma = \pi/2 =$$

$$\sin^{-1}(1/D) + \sin^{-1}(2/D) + \sin^{-1}(3/D).$$

Solving this for D gives a cubic equation $u^3 - 28u^2 + 196u - 144 = 0$, where $u = D^2$.

One can find the roots of this equation with Newton's method; the solution is $D = 4.114$.

Also solved by William Dunbar, Colonel Foster L. Furphy, S.M.'48, Michael A. Goldberg, John W. McNear, '59, R. Robinson Rowe, '18, Frank Rubin, '62, Paul J. Schweitzer, '61, Lars H. Sjodahl, '35, Glenn W. Zeiders, '59, Messrs. Rosenthal and Yu, and the proposer.



37 Arrange six line segments of equal length in the plane to form eight equilateral triangles.

Mark Yu says, "Hey, man, I'm a Zionist, too." (The answer, of course, is the Star of David.)

Also solved by Robert G. Gottlieb, '60 (no known relation), John L. Joseph, '40, Sanford M. Libman, '65, Roddy R. Rogers, S.M.'57, Messrs. Lipes, Rowe, Rubin, Sjodahl, and Zeiders, and the proposer, Mr. Hoylman.

38 Given four colored cubes described as follows:

	Front	Right	Back	Left	Top	Bottom
Cube 1	Green	Blue	Red	White	Red	Red
Cube 2	White	Green	Green	Red	White	Blue
Cube 3	Blue	Red	White	Blue	Green	Green
Cube 4	Red	White	Blue	Green	Red	White

The problem is to pile the blocks one above the other so that each face of the pile shows all four colors. (Cubes are helpful but not necessary to solve the problem.)

I blew it this time. I listed the cubes in the order in which they belong. Several people noticed this, including Richard A. Bator, '65, Peter M. Kendall, '67, Karl R. Kennison, '08, Ted Leahy, Robert G. Millar, '40, John E. Prussing, '62, Messrs. Rogers, Sjodahl, and Yu, and the proposer, Russell A. Nahigian, '57.

But one virtue of the problem is that I received a reprint from the Rand Corporation containing several variants which will appear and the following letter from Milton Kamins, '48, which accompanied it:

Having enjoyed your material in *Technology Review* on more than one occasion, I am pleased to be able to pass on what I believe is an unusually neat solution to your problem 38. My own connection with (and interest in) the problem began a year ago when a friend received one of the first sets of these blocks seen locally, but without instructions. After what I think were a few months of silent frustration, he showed them to me. When I calculated the number of possible combinations, I quickly gave up the trial-and-error approach, exploited the one obvious (to me) asymmetry to eliminate more than 90 per cent of the combinations, and instituted a computer search of the remaining 10,000 or so, thus finding the solution. However, when my eight-year-old son tried the blocks he found the right combination in just about five minutes, unassisted. Tested again one day later, he took 10 minutes. At that point, I suggested that he quit while he was ahead.

39 Find n such that $n^4 + n^3$ is a 10-digit number in which each digit is used only once.

Everyone seemed to use some trial-and-error scheme to arrive at the fact that $(264)^4 + (264)^3 = 4,875,932,160$. Solved by Messrs. Leahy, Libman, Prussing, Sjodahl, and the proposer, John Reed, '43.

Better Late Than Never

A considerable accumulation of solutions and correspondence about previous problems in "Puzzle Corner" will be published in this department in the December issue.

Allan J. Gottlieb, '67, is a graduate student in mathematics at Brandeis University. Address correspondence to him at the Department of Mathematics, Brandeis University, Waltham, Mass., 02154.

Techno- logical Double- Croctic

	J	I	T	2	W	3		S	4	Z	5	H	6	O	7	A	8	G	9	X	10		R	11	C	12			
Q	13	V	14	Z	15	N	16	M	17	T	18	B	19	J	20	P	21		L	22	J	23	E	24		U	25	Z	26
D	27	K	28	M	29		K	30	Y	31	S	32	J	33	M	34	F	35	U	36	N	37	V	38	Z	39		I	40
X	41		O	42	D	43	Q	44		P	45	F	46	X	47	T	48	W	49	A	50	M	51	Z	52		F	53	
M	54		J	55	M	56		L	57	Q	58	T	59	Z	60	C	61	O	62	B	63	Z	64		A	65	D	66	
	E	67		E	68	M	69	Y	70	I	71	W	72		M	73	Y	74	L	75	D	76	G	77	V	78	R	79	
	E	80	R	81	C	82	W	83	G	84		P	85	E	86	T	87	S	88	H	89	R	90	B	91		L	92	
T	93		W	94	V	95	F	96		M	97	T	98	A	99	E	100	P	101		I	102	P	103	O	104	R	105	
Z	106		X	107	I	108		M	109	K	110		H	111	D	112	G	113	T	114		U	115	R	116	S	117		
M	118		O	119	M	120	Y	121		O	122	W	123	Z	124	P	125	N	126	Z	127	L	128	M	129	U	130		
D	131	B	132	M	133	C	134	H	135		I	136	M	137		V	138	Q	139	N	140	J	141	K	142	R	143	B	144

Use the definitions at the right to help define the words to which they refer; then enter the appropriate letters in the diagram to complete a quotation from a standard published work. Black squares in the diagram indicate the ends of words; when there is no black square at the right end of the diagram, the word continues on the next line. For the correct solution bearing the earliest postmark, *Technology Review* will award a copy of *Science and the Educated Man*, collected essays of Julius A. Stratton, '23, President Emeritus of M.I.T. Send solutions and comments to Dr. Holt in care of the *Review*, Room E19-430, Massachusetts Institute of Technology, Cambridge, Mass., 02139.

A. A priestly caste or order of ancient Medea and Persia.

B. Path; region or scope of activity, influence, etc.

C. Canvass; solicit; spy upon race horses.

D. Reaction force.

E. Just clear of the ground.

F. Knot; intersection.

G. To diminish progressively in amplitude.

H. Glossy fiber.

I. Group of eight.

J. Petroleum.

K. To repeat or imitate.

L. Editor of *Solid State Physics*.

M. Word O divided by angular acceleration (3 words).

N. Kind of collar or jacket.

O. Moment of forces.

P. Any coming; arrival; approach.

Q. Let out for temporary use.

R. Snoring.

S. Particle.

T. Favoritism shown to nephews.

U. Quick and neat in action.

V. About; concerning.

W. A kind of insanity.

X. (Aeron.) A component of the total air force.

Y. Chamber for heating, drying, etc.

Z. To race or cruise in a pleasure boat.

Z₁. Earthenware mug.

8 65 99 50

63 144 91 19 132

134 12 82 61

66 43 27 112 131 76

67 80 24 86 68 100

85 53 96 46

84 77 113 9

111 89 6 135

40 102 136 71 108

20 55 33 141 23 1

28 30 142 110

75 57 92 22 128

118 34 97 29 120 109 137 54

73 56 129 17 51 69 133

16 126 140 37

42 119 62 122 104 7

103 85 45 21 125 101

58 44 139 13

105 11 143 90 79 81 116

4 88 117 32

2 59 114 48 93 98 87 18

130 36 115 25

138 95 14 78 38

83 123 72 94 49 3

47 107 41 10

31 70 121 74

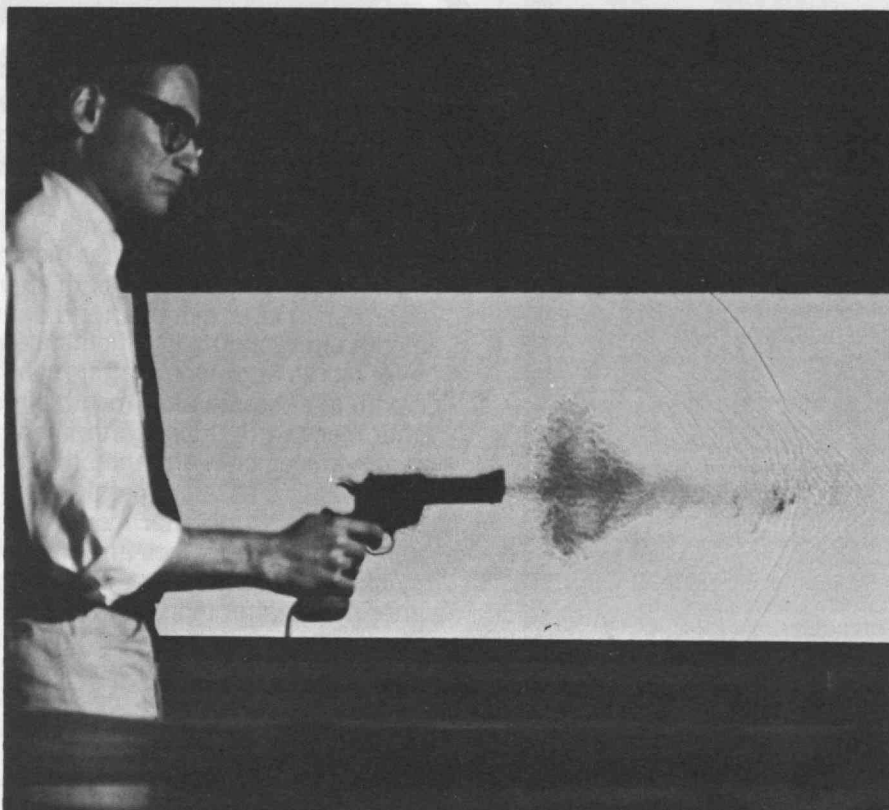
52 124 60 26 5

39 15 106 127 64

David L. Holt is Assistant Professor of Metallurgy at M.I.T.

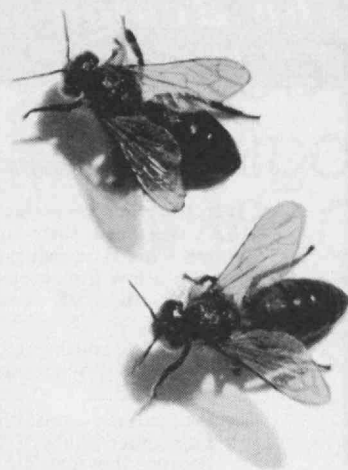
Strobe Probe

Harold E. Edgerton, Sc.D.'31



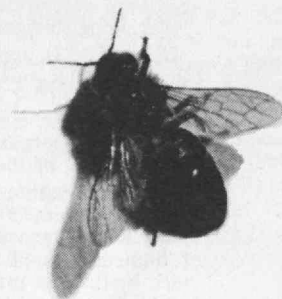
Barry H. Rosof, '63, Research Assistant in Metallurgy, fires a 38-caliber revolver with a blank cartridge. Note the shock wave.

Can you explain how this picture was taken? (*The answer is on page 97.*)



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workers working
for you.**

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them alive.**



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This Space Contributed by the Publisher

Over time an increasing percentage of the most talented MBA's will begin their business careers as professional consultants. This is as natural as it is for a lawyer to begin his career in a law firm even though he later becomes a public servant or corporate executive. The underlying reasons are compelling.

- No single business can provide the breadth of condensed experience that can be obtained in professional assignments.
- Professional consulting firms can and do pay more than other kinds of organizations. They can pay more because they can use talent more quickly and more intensively. Whatever a man is worth to a large, structured organization, he can be worth even more to a consultant, at least in the early years.
- A career as a consultant closes no options but rather opens them. A consultant is not automatically "type-cast" in terms of function and industry by his initial selection of an employer. A consultant can choose his field of concentration by exploring his interests and then developing them. His experience becomes a guide rather than a commitment.
- Industry and business generally will look more and more to men with consulting backgrounds to fill major positions. This is natural since the minimum qualifications are so high, the experience so condensed, the training so rigorous.

Consulting is unique in its ability to utilize the MBA's talent and education fully, without an intervening period of "apprenticeship." Conversely, because of the analytic demands facing it, consulting as a profession could not exist without the rigorous educational preparation made available by the advent of the graduate school of business.

The combination of these two factors makes the professional management consulting firm based on conceptual ability and grounded in research techniques the natural field of immediate application for the talent and training provided by the best products of the best business education. As MBA's find consulting increasingly attractive as an entry into the business world, the trend will be for consulting to serve as the bridge between formal education and top corporate management.

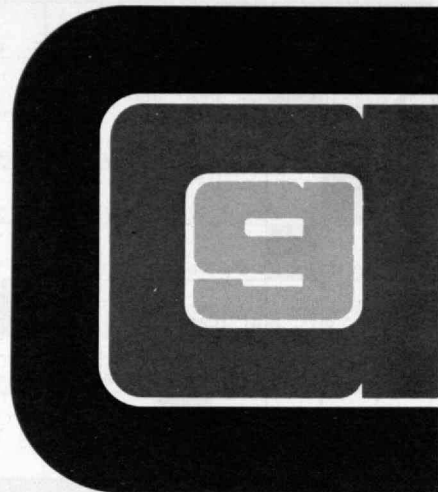
The real inhibition of this trend has been a revered tradition of "office boy to president" which is a legacy of America's pioneering days. In those days there was no way to learn except in the school of hard knocks. Experience was the only teacher (pre-case method). Young men had to become old men in order to acquire this experience.

Today these factors still exist but their relative importance has diminished in comparison with preparation by education. The demand for MBA's reflects the general consideration that education can be substituted for experience, thus shortening the time span before maximum use can be made of the available talent.

MBA's by definition have made a firm commitment on the side of education, and more and more are recognizing that management consulting is a logical extension of that commitment. Industry has a major incentive to serve this commitment: they will be the major beneficiaries both short term and long term.

The Boston Consulting Group is a professional management consulting organization which specializes in the policy problems related to corporate strategy. It works with clients and publishes articles in these and related fields.

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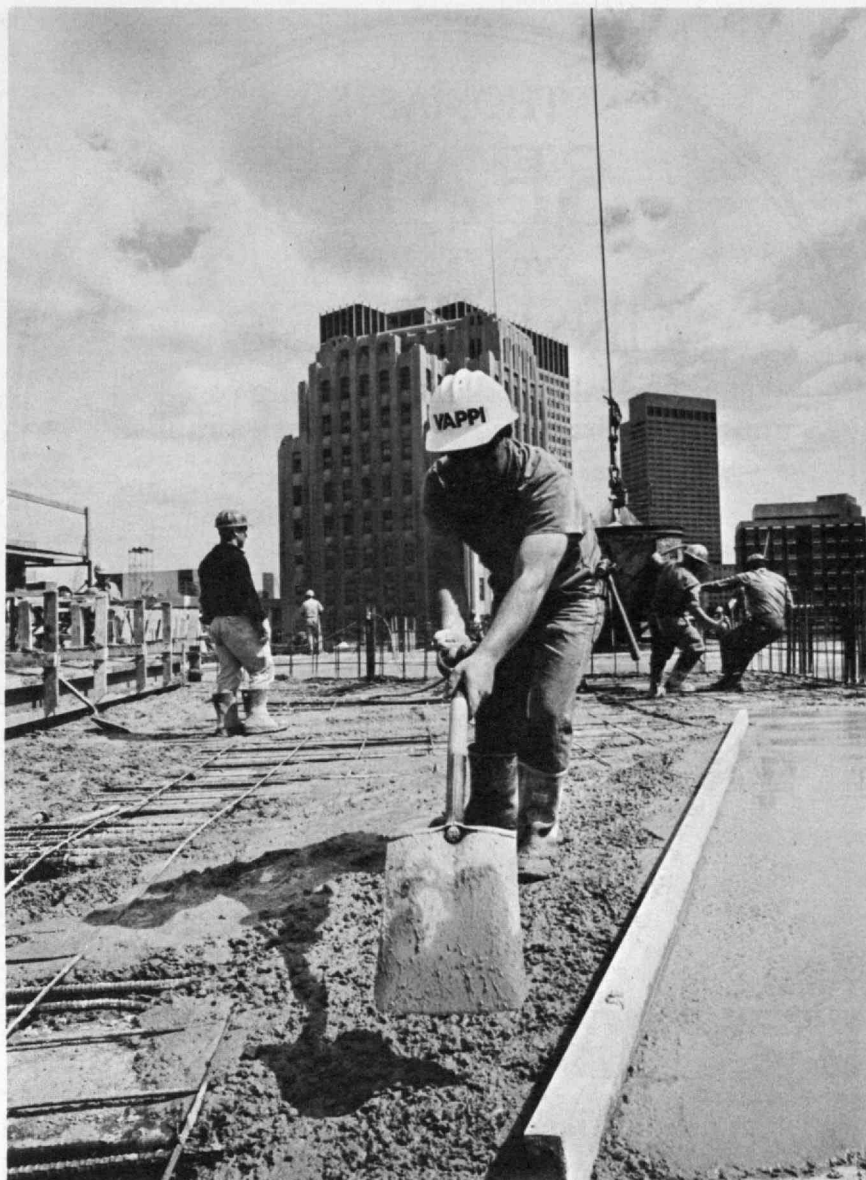
Philip E. Nutting
MediaRep Center/New England
710 Statler Building
Boston, Mass. 02116
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"Strobe Probe" Answer

The background behind the gun (see page 95) is Scotchlite; it reflects light from a small xenon lamp located at the camera lens. The lens is focused on the background in order to image the shock wave image.



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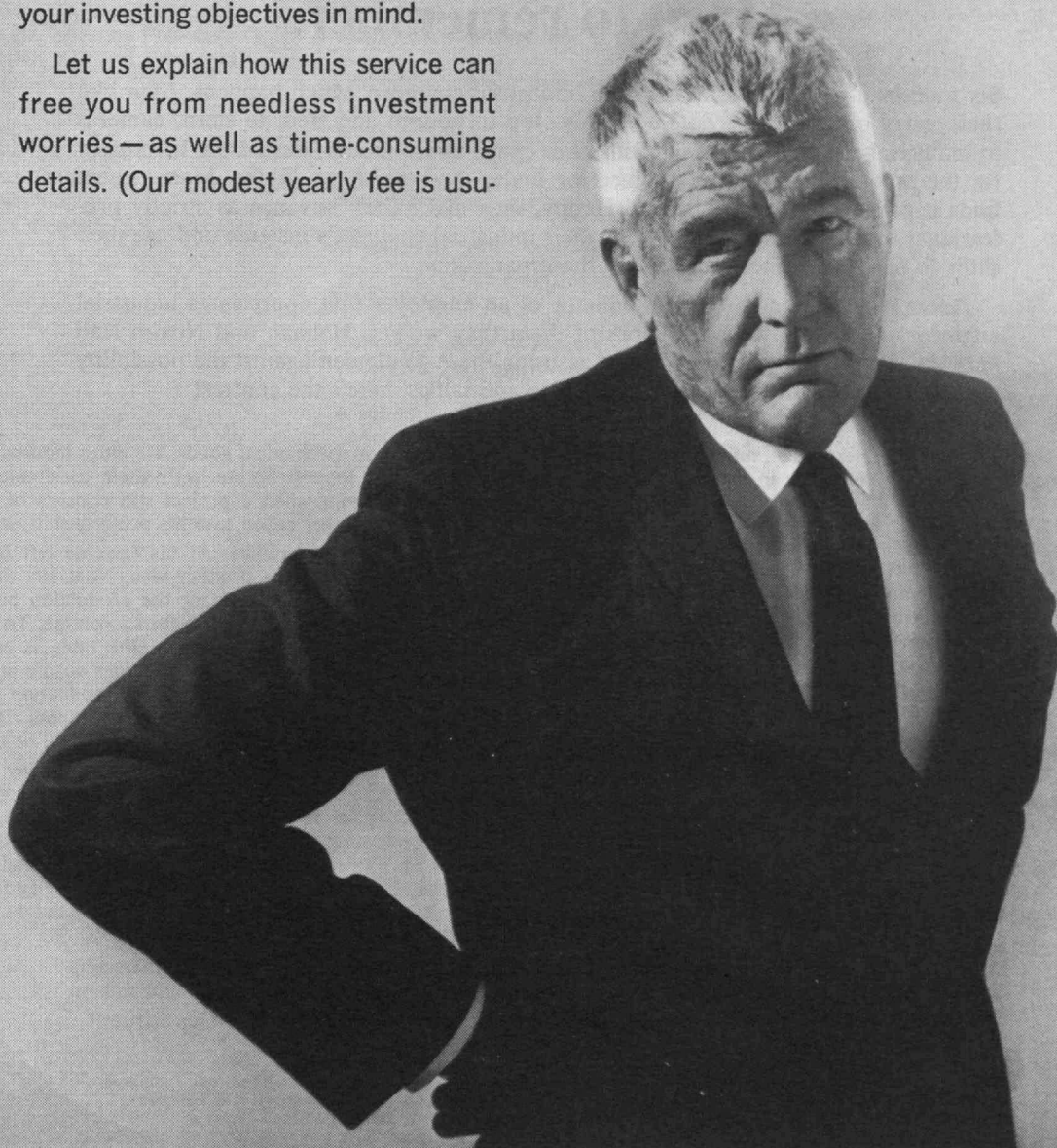
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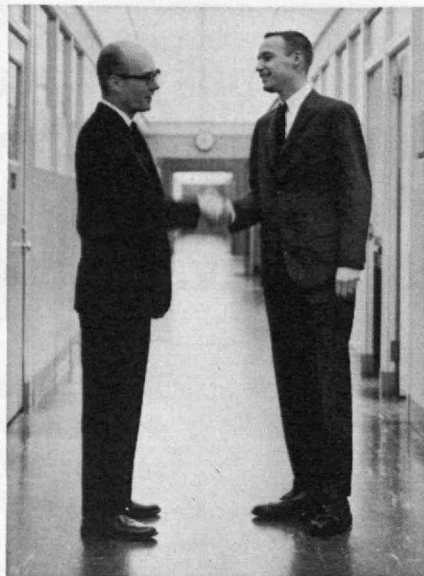
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Boston, Mass.



John C. Heiman,
a typical Kodak
industrial engineer ▶



◀ Elwood R. Noxon,
a typical Kodak
industrial engineer

What was crucial six months ago? Hard to remember.

Six months is a long time to a Kodak industrial engineer. Much happens. Men like these carry on as if the whole company—top to bottom and stem to stern, cameras to industrial adhesives, food emulsifiers to check microfilers—were a big laboratory for the practice of industrial engineering under the best of conditions. Management finds it pays to let them think so. Happy, they make their advance as strictly professional industrial engineers or hide their industrial engineer's insignia and use their skills to take over other functions in the organization.

Apart from the common denominator of an employer that appreciates industrial engineers and can always use more of them than we get, Heiman and Noxon lead very different working lives. Without assuring these gentlemen against the possibility that six months hence they will have traded specialties, here's the contrast:

Heiman is an accomplished simulation man, a thinker in Fortran, a builder of models for the big computer to manipulate.

He made a good score lately when given six weeks to overhaul the reasoning behind the design of a chemical manufacturing system that had evolved over the last five years as a multi-channel processing plant with problems in line interference and flexibility. He and a colleague, checking each other, spent three weeks writing a program that covered building size, reactor size, product flow, and auxiliary equipment. Debugging took another three weeks. All the while a third man was collecting experience data from the old production area.

The experience data were converted into Monte Carlo input distributions. Various configurations of the proposed production equipment were studied in thirty computer experiments, each simulating twelve weeks of operation.

Result: a system costing 3% more than the original but with 25% more capacity, plus proof that certain manifold connections between reactors wouldn't work.

Noxon works on mechanical goods. He pities industrial engineers who don't get to collaborate with their mechanical engineer partners right from when a project still consists of only rough sketches. He does get called into his projects that early.

His place is in the middle. At his extreme left is the design engineer who created the product idea. Next sits the manufacturing engineer, devising ways for the production boss to transform the idea into reality at the required volume. To the quality-control engineer at the other end of the table is entrusted the whole reputation of the company as it rides on the proposed new product. Between him and Noxon, the production boss awaits instructions. Noxon's job is to sell cost awareness right and left. Unless each of the five gets in his licks, there will be trouble.

Noxon can't stay in the conference room all day. The action is on the factory floor. In putting together job designs, learning curves, and space requirements for the 1970 line, he cannot ignore the ongoing commitment to 1969 product and the lively remnant of '68 production. And cost reductions had better continue when Noxon and his teammates study the "audit assembly" movies from initial production.

Industrial, chemical, mechanical, and electrical engineers who find their profession interesting and would like to practice it in a way that best suits their individual makeup should talk to
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Institute Review

Gardner: New Leadership for Social Renewal

In his first appearance as Germeshausen Visiting Professor at M.I.T., John W. Gardner, former Secretary of the Department of Health, Education and Welfare who is now Chairman of the Urban Coalition, told an audience of over 500 M.I.T. alumni and their guests on September 6 that America must have a total "renewal of society."

The deficiencies in American life today, he said, can be remedied only by new leadership, qualified and capable in what he called "the orchestration of human conflict, without which this nation cannot survive."

Dr. Gardner admitted that modern leadership is "a great deal harder than in the past." He characterized the task as "helping us to focus our energies, set priorities, symbolize our values, and keep hope alive—helping us to believe that there is a future and that we can achieve our purposes despite failures."

Leaders who can meet this need, he said, are not being trained in America today. The seriousness of the situation is compounded, Dr. Gardner believes, by the "distressing fact that we are in a phase of withdrawing confidence in our institutions."

Dr. Gardner listed five guideposts for effective modern leadership:

1. New leadership must achieve a change in the framework of order, making social institutions truly responsive to human needs.
2. There must be equal access to society's benefits, equal opportunity for all Americans. "There is no way for this generation to avoid that demand," he said.
3. New leadership must assure a higher quality of American life, overcoming pollution and in general avoiding the domination of individuals and social institutions by technology.
4. The individual must be assured a place in society. The leader must understand that at its best this society is "an extraordinary releaser of human energy and originality," he declared, and the leader must somehow achieve for

every individual an opportunity to share in this adventure.

5. America depends upon shared values and beliefs. Though we are now "grossly unfaithful to these values," we have not really abandoned them. The task of the leader is not just to reassert our values but "to make our values live in the lives of men, in our institutions, and in our laws," Dr. Gardner declared. "The final and highest task of the leader is to remind us that this nation depends ultimately on our faith and our faithfulness."

Sensory Aids Evaluation

Vito A. Proscia, a systems engineer with a background in physics and electrical engineering, has been appointed Director of the M.I.T. Center for Sensory Aids Evaluation and Development to succeed the late John K. Dupress.

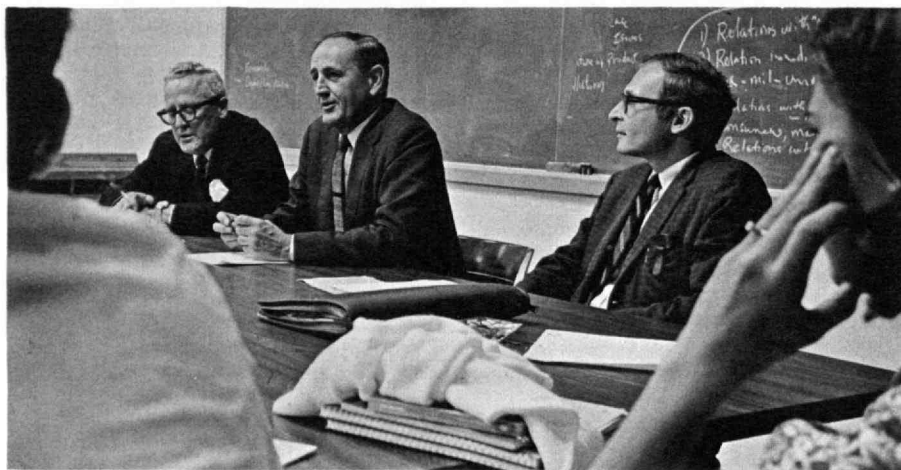
Mr. Proscia, who comes to M.I.T. from the research staff of the Mitre Corporation, lost his sight while in elementary school in New York City, studied at the New York Institute for the Blind in the Bronx, and holds degrees from the City College of New York and Columbia University. His professional experience includes work on weapons

systems and radar analyses at Columbia's Electronics Research Laboratory, doctoral studies at Brooklyn Polytechnic Institute, and work as a systems analyst at two aircraft manufacturing firms.

Mr. Dupress, Mr. Proscia's predecessor as Director of the Center, helped establish the Center to evaluate, field test and bring to engineering readiness devices that might aid persons deprived of one or more of their senses, particularly sight. Among promising items now under evaluation are a high-speed electromechanical Braille, special canes that may be folded away when not in use, and a sonar-like mobility aid that might one day help the blind move about freely.

To Systems Engineering

William W. Seifert, Sc.D.'51, who has been Assistant Dean and Assistant to the Dean of the School of Engineering since 1959, has given up his administrative duties to become Professor of Engineering in the Department of Civil Engineering; he will devote full time to teaching and research in systems engineering, and in that work he will be associated with the new interdepartmental Urban Systems Laboratory.



John W. Gardner's first classroom appearance at M.I.T. occurred on October 3, nearly a month after he spoke to the Alumni Officers' Conference. Dr. Gardner is Germeshausen Visiting Professor at

M.I.T. this year, leading a seminar on urban problems with Mason Haire, Professor of Management (left), and Bernard J. Frieden, Associate Professor of City Planning (right).

Dean Seifert's administrative assignments will be assumed by Robert H. Scott, '64, who has been Administrative Assistant to the Dean and now becomes Assistant Dean for Administration of the School of Engineering. The changes were announced this summer by Gordon S. Brown, '31, Dean of Engineering.

Dean Seifert has provided leadership for M.I.T.'s interdepartmental research program on advanced transportation systems, and he has played a leading part in developing interdepartmental systems engineering courses in which seniors and graduate students from many departments come together to work as a team on large-scale problems involving social, political, and economic as well as technological issues. Dean Seifert already holds an appointment in the Department of Electrical Engineering; his new assignment in the Urban Systems Laboratory means that M.I.T.'s transportation research and the several systems engineering courses can be more closely associated with the urban systems work, and the whole can become a major focus of M.I.T.'s systems engineering research, according to Dean Brown.

Project MAC Director

Joseph C. R. Licklider, Professor of Electrical Engineering, has been named to direct Project MAC, M.I.T.'s major research center on multi-access time-shared computer systems and networks. He succeeds Robert M. Fano, '41, Ford Professor of Engineering, who has been its Director since he organized the Project in 1963 and who now wishes to return to full-time teaching and research.

Dr. Licklider, a psychologist with a broad background in human uses of computers and data banks and in the use of multi-access computer systems as a means of communication between individuals, is "particularly prepared to assume leadership of the MAC program," according to Jerome B. Wiesner, Provost, who announced the change. Dr. Licklider studied at Washington University and the University of Rochester and has worked in psycho-acoustics, engineering psychology, and information systems at Harvard University, M.I.T. (Associate Professor of the Psychology of Communication from 1950 to 1957), Bolt, Beranek and Newman, Inc., the Advanced Research Projects Agency of the Department of Defense, and International Business Machines Corporation. He returned to M.I.T. to rejoin the Department of Electrical Engineering in 1967.

A native of Torino, Italy, Professor Fano has been at M.I.T. ever since he entered as an undergraduate with the Class of 1941, first in the Radiation Laboratory and later as a member of the Research Laboratory of Electronics and the faculty in the Department of Electrical Engineering, where he is Professor of Electrical Communications.



W. W. Seifert, Sc.D.'51



J. C. R. Licklider



Edgar H. Schein



N. J. Grant, Sc.D.'44

Undergraduate Planning

Edgar H. Schein, Professor of Organizational Psychology and Management in the Sloan School of Management, has been named Undergraduate Planning Professor for a two-year term. He succeeds George E. Valley, Jr., '35, Professor of Physics, who was named Undergraduate Planning Professor when the post was created by the Committee on Educational Policy three years ago.

In his new assignment, Professor Schein's responsibility will be "to facilitate continuous evolution in the undergraduate curricula," according to Howard W. Johnson, President of M.I.T., in his announcement. This includes studies of freshman performance, curricular developments, academic effectiveness, and other aspects of the Institute's undergraduate programs.

To the assignment Professor Schein brings "a unique background of teaching and research experience on organizational and educational problems," President Johnson said. After studies at Chicago, Stanford and Harvard, he spent several years as Chief of Social Psychology in the Neuropsychiatry Division of Walter Reed Army Hospital in Washington; he came to M.I.T. in 1956, and since then he has done extensive research on the dynamics of management education, the problems graduates face in their transition from university to first job, and the relationship between teacher, student, subject matter, and learning outcomes.

Materials Science Director

Nicholas J. Grant, Sc.D.'44, Professor of Metallurgy, has been appointed Director of the M.I.T. Center for Materials Science and Engineering to succeed Robert A. Smith, who resigned to become Principal and Vice Chancellor of Heriot-Watt University in Edinburgh, Scotland.

Dr. Grant studied at Carnegie Institute of Technology (S.B., 1938) and worked for two years as a mill metallurgist for the Bethlehem Steel Company before coming to M.I.T. as a graduate student, and he has been a member of the faculty since 1944.

Originally working in the field of physical chemistry in steelmaking, Professor Grant more recently turned to high-temperature metallurgy. He has served on various professional committees and holds the Distinguished Service Award of the Precision Investment Castings Institute and the Merit Award of the Carnegie Institute of Technology for excellence in teaching and research.

The Center for Materials Science and Engineering, of which Dr. Grant is Director, has one of the largest interdisciplinary programs of teaching and research at M.I.T., focusing on many kinds of materials, including metals, ceramics, plastics and semiconductors. Major support comes from the Advanced Research Projects Agency, and more than 50 M.I.T. faculty from the Departments of Metallurgy and Materials Science, Electrical Engineering, Physics, Chemistry, Civil Engineering, and Mechanical Engineering, some 25 postdoctoral students, and nearly 200 graduate students are active in its programs.

Community Health vs. Medical Privacy

A model system for an areawide, co-operative health information system to serve a large number of diverse health agencies, including hospitals, doctors, and public health groups, is to be developed by the Joint Center for Urban Studies of Harvard University and M.I.T. under a \$92,000 contract from the Community Profile Data Center of the Division of Medical Care Administration, U.S. Public Health Service.

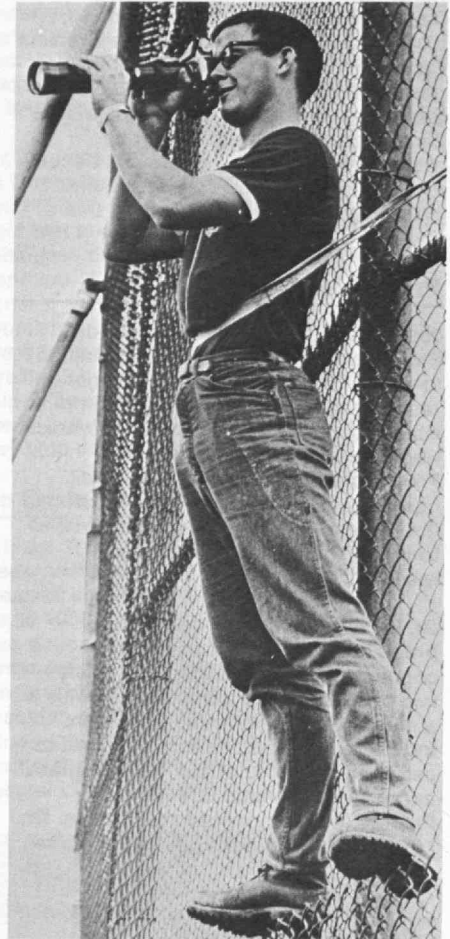
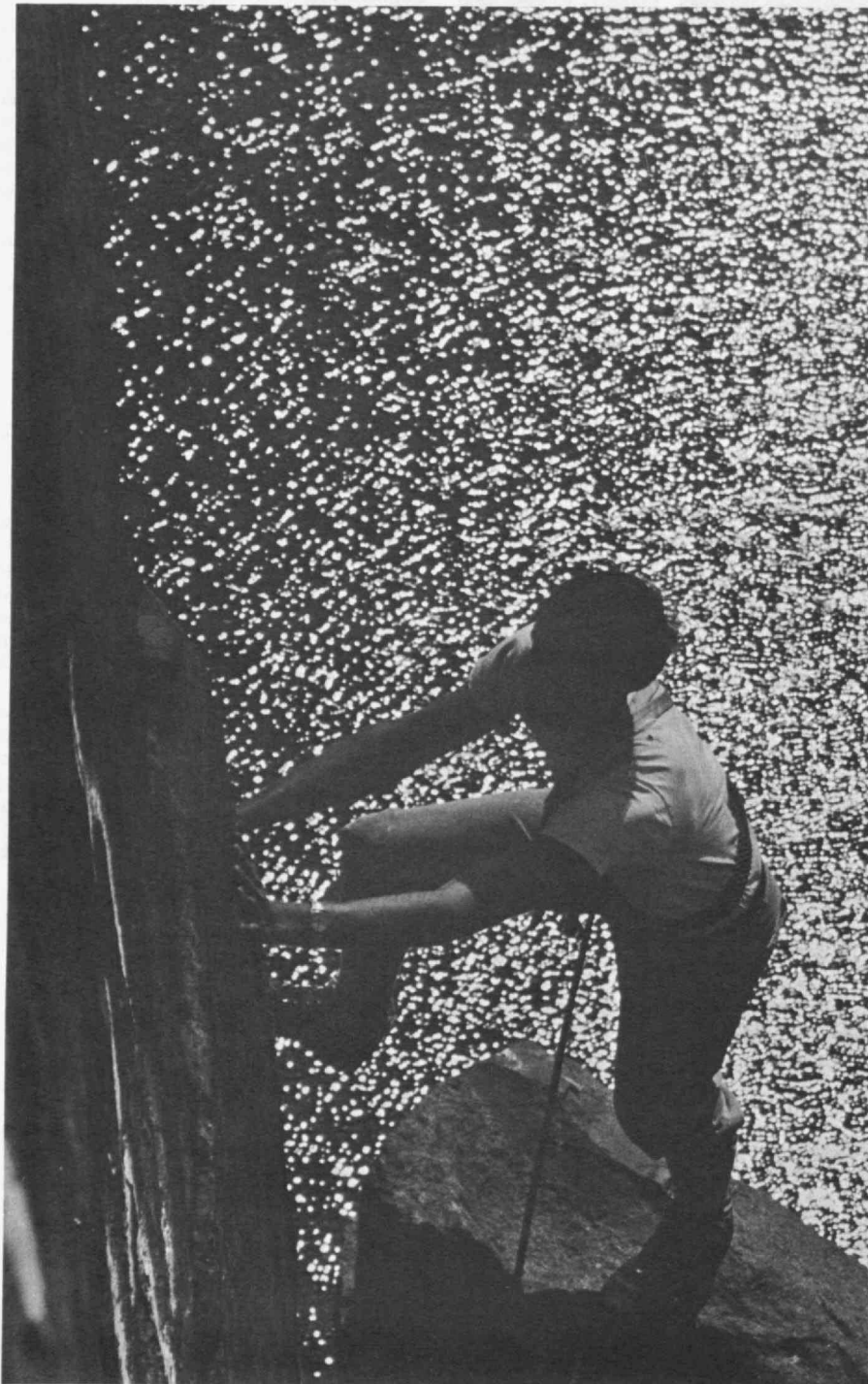
The result, according to Dr. Robert Marsten, Acting Administrator of the P.H.S. Health Services and Mental Health Administration, could be significant savings in time and manpower for all the co-operating health agencies. Selected, pooled data provided through automatic storage and retrieval could also aid in medical research, in preventive medicine, and in comprehensive health services planning, he said.

Receiving special attention will be the question of privacy and confidentiality of records, a study to be directed by William J. Curran, Visiting Professor of Health Law at Harvard. In general, the project sponsors report, there has been little work on the question of privacy and the protection of data within community health information systems. Dr. Curran believes that automatic data handling will actually provide greater protection than conventional methods. But the study may recommend new laws to protect privacy under new information-processing procedures, he said.

"... Then You Have Arrived"

Jeffrey M. Reynolds, '69, the fence-viewer with a telephoto lens, below (photo by Richard M. Koolish, '68), makes a unique annual gift to Sigma Alpha Epsilon—a photo album which is in fact a picture story of the chapter's year. With the photographs come some captions of relevant wisdom, of which a sample below:

"When you look around and find yourself very busy and, often enough, very happy and yet not know why, then you have arrived."



Among Mr. Reynolds' highlights of the S.A.E. year: left: Joel P. Robinson, '68, at the Quincy quarries; and opposite: M. Jack Anderson, Jr., '69, reaching for a touch football pass; pitcher David L. DeWitte, '69, twisting both face and ball; and Samuel F. Leader, 2d, '69, with his clarinet on the Kresge Auditorium stage.



LCS-3 and UV: Lost But No Obituary

Two M.I.T. experiments were lost this summer when an Air Force Atlas/Burner II rocket failed to deliver them into orbit on August 19. Lincoln Laboratory's third Calibration Sphere (LCS-3) and an Instrumentation Laboratory ultraviolet detector were among 12 experiments on the anomalous launch SESP 68-1.

LCS-3 was a precision aluminum ball accurate to within a few thousandths of an inch, designed to reflect radar and radio signals with such precision that it could serve as a primary standard for calibrating the transmitters from which the signals came. Lincoln's LCS-1 (May, 1965) has been used successfully by a number of high-powered radar systems; LCS-2 (October, 1965) was lost in launch, and LCS-3 was intended for a low polar orbit which would have been useful to many radar installations for which LCS-1 is out of range.

Instrumentation Laboratory's ultraviolet detector was planned to measure ultraviolet radiation from the earth's atmospheric limb—the narrow band of illuminated atmosphere that appears to ring the planetary disc when earth is viewed from space. It was to determine if the shape of the limb is predictable or random—whether ultraviolet radiation can be used as a reference for space vehicle navigation and attitude control.

A Lincoln Laboratory spokesman told *Technology Review* that no obituary for LCS-3 seemed appropriate; when one member of the Lincoln Laboratory team on Kwajalein Island in the Pacific teletyped to the home office for a status report shortly after the launch hour, Lincoln Laboratory communications officers transmitted just one word: wet.

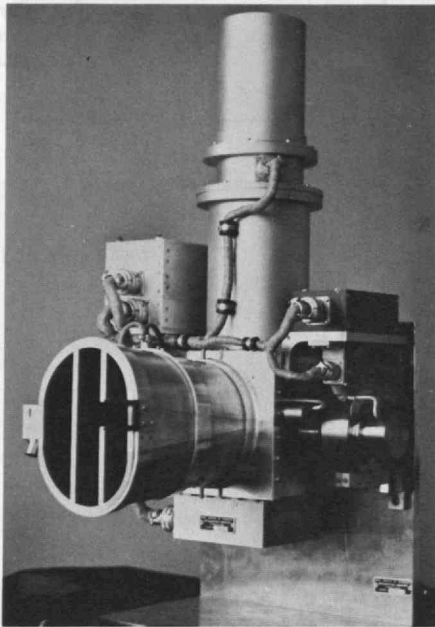
W. K. Lewis ('05) Professorship

M.I.T.'s "grand old man," Warren K. Lewis, '05, Emeritus Professor of Chemical Engineering, is to be honored by the Warren K. Lewis Professorship. A sponsoring committee of 14 distinguished alumni under the leadership of Crawford H. Greenewalt, '22, of the E. I. du Pont de Nemours and Company, is now seeking a fund "substantially in excess" of the \$600,000 minimum required for a professorship at M.I.T.

The sponsoring committee's announcement notes that Professor Lewis, "beloved throughout the world as the father of modern chemical engineering, has been one of the great teachers of engineering in this century. He has been known to generations of students as 'Doc' Lewis, a compelling lecturer, a demanding taskmaster, and a warm friend.

"Dr. Lewis' contributions to the development of chemical engineering and its applications to industrial technology," continues the committee's statement, "had far-reaching consequences . . ."

Two M.I.T. experiments were lost when an Air Force Atlas/Burner II failed to orbit them on August 19. Left, the Lincoln Laboratory Calibration Sphere was designed to precisely reflect radar energy; the Instrumentation Laboratory's ultraviolet detector (right) was planned to measure the stability of ultraviolet radiation in the earth's limb when viewed from space.



Members of the sponsoring committee, in addition to Mr. Greenewalt, include Marion W. Boyer, '25, Stewart P. Coleman, Sc.D.'31, Bradley Dewey, '09, Harold W. Fisher, '27, Per K. Frolich, Sc.D.'25, Robert C. Gunness, Sc.D.'36, John C. Haas, S.M.'42, Robert L. Hershey, '23, Ralph Landau, Sc.D.'41, Charles E. Reed, Sc.D.'37, Robert B. Semple, '32, David A. Shepard, '26, and Clarence L. A. Wynd, S.M.'27.

Miguel Sidrauski, 1939-1968

Miguel Sidrauski, Assistant Professor of Economics, died suddenly following a heart attack at his apartment in Eastgate on Sunday, September 1.

Born on October 12, 1939, in Buenos Aires, Professor Sidrauski graduated from the University of Buenos Aires in 1961 and received his Ph.D. degree from the University of Chicago in 1966, when he was appointed to the M.I.T. faculty.

In a brief two years, said Howard W. Johnson, President of M.I.T., in reporting his death, Professor Sidrauski had established himself as "an outstanding teacher of both undergraduates and graduates. He had participated actively in undergraduate course revision and in the selection of graduate students," President Johnson said, "and in his primary field of research—money, inflation and economic growth—he had published several important papers."

Administrative Appointments

Five new appointments to the administration of the Institute have been announced during the summer: Jack W. Christensen, '58, Director of the Industrial Liaison Office; Stuart H. Cowen, Administrative Director of the Division of Sponsored Research; Richard N. Smillie and Frank R. Stevens, '46, Associate Directors of the Division of Sponsored Research; and Robert K. Weatherall, Assistant Dean of the Graduate School and Associate Director of Admissions.

Mr. Christensen, a member of the Industrial Liaison Office since 1963, will now be responsible for this activity designed to keep participating industrial firms closely related to teaching and research at the Institute. He succeeds Frank T. Bauchspies, S.M.'57, who has joined Gulf Oil Corporation.

To his duties as Director of Fiscal Planning, Mr. Cowen will add his new assignment in the Division of Sponsored Research, responsible for fiscal and business management of research contracts awarded to M.I.T. by government and industry. Both Mr. Smillie and Mr. Stevens have been Assistant Directors of D.S.R.; the appointments are in connection with the retirement last June of F. Leroy Foster, '25, as Director of D.S.R.

Mr. Weatherall will have special responsibilities for Selective Service problems relating to graduate students, and he will interview prospective M.I.T. undergraduate students and visit secondary schools, particularly those with large Negro enrollments, to talk about M.I.T. with high school juniors and seniors. He has been at the Institute since 1956 and for the past two years has been a Research Associate in connection with the National Research Council Study of Postdoctoral Education.

John W. Milnor: Distinguished Mathematician to M.I.T.

John W. Milnor, who has been Henry Putnam Professor of Mathematics at Princeton University since 1962, has come to M.I.T. this fall as Alfred P. Sloan Professor in the Department of Mathematics. In announcing the appointment, Dean Robert A. Alberty of the M.I.T. School of Science called Dr. Milnor "one of the world's most distinguished mathematicians."

Dr. Milnor graduated from Princeton in 1951 (A.B.) and in 1954 received his doctorate; six years later he became Professor of Mathematics at Princeton. He holds the Fields Medal, the highest honor for a mathematician, from the 1962 International Congress of Mathematicians; he was elected to the National Academy of Sciences in 1963; and in 1966 he received the President's National Medal of Science for "ingenious approaches in topology which have solved long-outstanding problems and opened exciting new areas in this active branch of mathematics."

Biophysics International

Preliminary plans have been completed for M.I.T. to act as host to the Third International Congress of the International Union for Pure and Applied Biophysics which will meet in Cambridge from August 29 through September 3, 1969. Walter A. Rosenblith, Professor of Communications Biophysics, is Chairman of the Organizing Committee, and Detlev W. Bronk, President of Rockefeller University, is Honorary President. Other members of the Organizing Committee include Franklin Hutchinson '42, Professor of Biophysics at Yale University, and Walter L. Koltun, '48, of Bolt, Beranek and Newman.

The scientific program will include symposia on the natural history of macromolecules, protein structure and function, artificial internal organs and physiological support devices, assembly of large structures, and the molecular basis of the memory trace. In addition, there will be sessions presented by various commissions and committees of the Congress and on aspects of mathematics and instrumentation. Registration information is available from Professor Rosenblith.

Light—An Exhibition And a Collection

A biennial program of major photographic exhibitions and a permanent M.I.T. collection of contemporary photography have been inaugurated at the Hayden Gallery this fall with *Light⁷*, an exhibition of 85 photographs by 75 photographers arranged under the direction of Minor White, Visiting Professor of Photography in the Department of Architecture.

The title *Light⁷* need not be interpreted to mean light to the seventh power or the seven levels of light, according to Professor White, although both of these structurings are inherent in the show. The exhibition falls into such sections as "Let the Light Make Love," "Let the Light into the Self," and "Let the Light Regenerate"; its existence, Professor White says, is accounted for by the "affinity of the photographs for each other."

The exhibited photographs were chosen from more than 3,500 entries received from over 200 photographers. Among the well-known contributors are Barbara Morgan, Lotte Jacobi, and Ansel Adams.

Winqvist Memorial

The Gertrude B. Winqvist Memorial Fund has been established by the Board of Governors of M.I.T. Endicott House in Dedham, and friends and colleagues are invited to contribute toward the purchase of art objects to serve as a tribute to the first Director of the House.

Mrs. Winqvist, who died in Greenwich, Conn., on May 25, 1968, was Director

of Endicott House from 1955 to 1967. During these years, say the members of the Board of Governors, "she brought charm and grace to the M.I.T. community; she accomplished the extraordinarily difficult task of preserving the intrinsic character of the House while making it operationally useful to M.I.T."

Humanities Series: Five Concerts, Two Debuts

Two Boston debuts will be included in the five concerts of the M.I.T. Humanities Series in Kresge Auditorium in 1968-1969. Severino Gazzelloni of Rome, an outstanding flutist, will make his first Boston appearance on February 16, and on March 2 the Philadelphia String Quartet will make its Boston debut.

The series will open on October 27 with a recital by the Dutch harpsichordist Gustav Leonhardt on his ninth American tour. Other attractions will include the Camerata Bern of Switzerland, presenting baroque, classical, and contemporary works for string orchestra on November 24 and a third M.I.T. appearance of the Borodin Quartet of Moscow on January 12.

Series tickets (\$10) and single tickets (\$3) are available from the Kresge Auditorium Box Office.

Compton Seminars

Because "there has been some dissatisfaction in the past that M.I.T. hasn't used its name to draw big-name speakers on contemporary issues," Mark Mathis, '69, and a student committee have joined with the faculty and administration to develop a new Compton Seminar series this fall. The series is planned to cover such topics as international affairs, education, science policy, and contemporary medicine.

The program aims to draw a panel of prominent men to the campus several times each semester so that students can hear—and question—their statements on how contemporary history is made. The program originated from an investigation made last winter of existing lecture programs at M.I.T. by the Activities Executive Board. "The co-operation and support of the faculty and the administration have been wonderful," Mr. Mathis said. But, he said, the students are running the program.

The year's starter set a high standard for the rest of the year. A four-man panel discussion on "The Urban Scene: Complexity, Conflict, and Community" included as speakers Jerome P. Cavanagh, Mayor of Detroit; Henry Maier, Mayor of Milwaukee; Claude Brown, author of *Manchild in the Promised Land*; and Paul Ylvisaker, Commissioner of the New Jersey Department of Public Affairs. Former Mayor of Boston John F. Collins, now Visiting Professor of Urban Affairs at M.I.T., was moderator of the panel.

Alumni Review

Toward Greater Involvement, and "I Can Arrange It"

The key word was "involvement"—an unconventional institutional involvement going far beyond raising funds, cheering teams, arranging meetings and writing letters—when nearly 600 alumni and wives returned to Cambridge on September 6 and 7 for the 1968 National Alumni Officers' Conference. For, as James R. Killian, Jr., '26, Chairman of the M.I.T. Corporation, said to the closing luncheon of the conference, today's university "must retest its values, standards and programs with a clear understanding that the immense problems of our society require a new level of concern and reach and action, and therefore pose a challenge of immense new dimensions to education."

Most of the conference was directed to an understanding of this challenge.

Walter A. Rosenblith, Professor of Communications Biophysics who is Chairman of the Faculty, traced it to M.I.T.'s growing efforts to "understand better the world it is affecting, the world it is trying to serve." By pushing back the frontiers of science and technology, he said, "we automatically increase the distance between those who are capable of using the most advanced science and engineering and those who are either illiterate in their use of technology or are otherwise unable to command the resources required to make it work." Human curiosity and human concern mutually enhance each other, he said, "and the purposes of this symbiosis are to see to it that the products of man's brain, be they labeled science, technology, or management, serve to fulfill man's potential as an individual and as a group."

Six members of a student panel put these issues into their most practical terms. Every undergraduate, said Maria Kivisild, '69, President of the Undergraduate Association, should at some point in his academic career gain an awareness of the larger social interactions of which he is a part, and the present system "is not conducive to involvement," she said. To an alumnus' question she added her feeling that

the Alumni Officers' Conference itself failed to involve its members in the real issues before the M.I.T. community because no students were on campus during the meeting. She urged her alumni audience to come back during the term to gain real understanding of the Institute as it is today; "I can arrange it," she assured them.

Thomas C. Woodruff, '70, Chairman of the student Social Service Committee, called special attention to the need for expert help on teaching methods and other problems of how to effect community change for students working in Cambridge and Boston schools and social work centers. Financial contributions from alumni, he said, would be one expression of involvement in this work.

Alan M. Gilkes, '68, a graduate student in electrical engineering who was a founding member of the M.I.T. Black Students' Union, and Michael A. Albert, '69, who headed an *ad hoc* summer study on social responsibility, both emphasized M.I.T.'s obligations as a teacher of future leaders, as an employer, as a user of construction skills, and as a resident of Cambridge to assure fair practices for minority groups. "America has provided nourishment for M.I.T.'s growth," Mr. Gilkes said, "and America is black and Puerto Rican, too. Much remains to be done by M.I.T. to fulfill its social obligations," he declared. (The students reported that 25 Negro students were enrolled at M.I.T. in 1967-1968 and only 2.7 per cent of the Institute's employees are Negro.)

In his charge to alumni attending the conference, Donald P. Severance, '38, Executive Vice President of the Alumni Association, proposed two channels through which the Association will express "its relevance to the times" this year. "Can we help to reduce the contradiction between the ideals we profess and the things we don't do?" he asked. And all Association activities this year, he said, should attempt to deal creatively with the ways in which science, engineering, management, and the social sciences can relate to the urgent issues before the nation, sharpening for alumni their "critical faculties that were so honed in their student days."





Nearly 600 alumni and their wives returned to M.I.T. in September to experience again what Howard W. Johnson, President of M.I.T., called "an environment which produces leadership." But, said President Johnson, the task now is to "make a major new effort. . .by offering a direct response to issues of human significance." In addition to the reunions of old friends, the pictures show Dean Peter P. Gil reporting on Executive Development Programs (p. 108); James R. Killian, Jr., '26, Chairman of the Corporation, at the closing luncheon (top); Arnold C. and Mrs. Rood ('21) registering; Cecil H. Green, '23, President of the Alumni Association, with Maria Kivisild, '69, President of the M.I.T. Undergraduate Association (above); and a conference of Educational Counselors (left).

Technology Review: Twice in the "Top Ten"

For the second consecutive year, *Technology Review* has placed among the ten outstanding college and university magazines in the annual competition of the American Alumni Council. In addition, judges cited Volume 70 of the Review for the magazine's effective coverage of alumni activities and for its "continuing education" content; and a special citation was given to the Review for the May, 1968, issue on "Technology and the Environment."

National Awards

Eight bronze beavers, highest alumni awards given in recognition of "distinguished service to the M.I.T. Alumni Association," were presented by Cecil H. Green, '23, President of the Alumni Association, at the banquet of the National Alumni Officers' Conference in

Cambridge on September 6. Later Gregory Smith, '30, President of the Association in 1967-1968, awarded three Presidential Citations to M.I.T. groups for support of Association activities last year.

Bronze Beaver awards were made to: Harold W. Fisher, '27, 40th Reunion Gift Chairman and Past President of the M.I.T. Alumni Center of New York, for "ready acceptance of demanding tasks" and "zeal in their effective fulfillment."

Irving D. Jakobson, '21, who "through manifold activities in support of M.I.T. . . . has given loyally, energetically and generously, extending himself beyond every commitment."

Abbott L. Johnson, '22, whose service on Visiting Committees, for the Educational Council, and in Alumni Fund work "reflect honor on M.I.T. and provide a model for his fellow alumni."

Carl M. Mueller, '41, a member of the Corporation Development Committee and of the Alumni Fund Board, who "has brought wisdom, contributed unselfishly, and responded enthusiastically" to M.I.T. affairs.

Stanley M. Proctor, '43, for "infectious enthusiasm for all things M.I.T." which has "earned him the respect and admiration of colleagues and the gratitude of the Institute."

Gregory Smith, '30, past President of the Association and a member of the Corporation, whose "accomplishment will be a lasting source of strength and inspiration" for the Association and M.I.T.

Julius A. Stratton, '23, President Emeritus of the Institute, who "as teacher, scholar, and administrator" has "cultivated and helped fulfill M.I.T.'s highest aspirations."

John J. Wilson, '29, for service to M.I.T. "exemplified by inspiring diligence, continuity, and enthusiasm."

Presidential citations were presented to the M.I.T. Clubs of Dallas and Fort Worth ("for outstanding accomplishment in effective alumni relations"), the M.I.T. Club of Delaware Valley ("growing ties with the Institute effectively demonstrated by the 1968 Regional Conference"), and the Class of 1928 ("possessed of a unique spirit since its undergraduate days").

Alumni, Review Appointments

Four appointments to the Alumni Association and *Technology Review* have been announced by Donald P. Severance, '38, Executive Vice President of the Alumni Association: Clyde C. Hall, Acting Managing Editor of *Technology Review*; Panos D. Spiliakos, '66, Assistant Secretary of the Association; Ann Peterson, Administrative Assistant; and Deborah Shapley, Associate Editor of *Technology Review*.

Mr. Hall, who will be on the *Review* staff until December 15, has contributed frequently to the magazine from Washington, D.C. He was Public Information Officer for the National Science Foundation for eight years beginning in 1956 and previously had served with the *Boston Herald* and Associated Press.

Mr. Spiliakos graduated from M.I.T. in Naval Architecture and Marine Engineering (1966) and Management (1968). He will be associated with Fred G. Lehmann, '51, Secretary of the Association, working primarily with class and professional course organizations.

Miss Peterson has been at M.I.T. since 1961, first as Technical Assistant in the Department of Nutrition and Food Science and later as Administrative Assistant to Jerome B. Wiesner, Provost; she holds the bachelor's degree in chemistry from Simmons College. Miss

Reunions 1969

60th	'09	Mr. Arthur L. Shaw, Chairman 290 Central Street Auburndale, Mass. 02166	M.I.T. Campus
55th	'14	Leicester F. Hamilton, Chairman 100 Memorial Drive Cambridge, Mass. 02139	M.I.T. Campus
50th	'19	W. O. Langille, Chairman Box 144, Gladstone, N.J. 07934	Chatham Bars Inn Chatham, Mass.
45th	'24	Russell Ambach, Chairman 135 Aspinwall Street Brookline, Mass. 02146	The Bald Peak Colony Club Melvin Village, N.H.
40th	'29	William Baumrucker, Chairman 363 Ocean Avenue Marblehead, Mass. 02116	Wianno Club Osterville, Mass.
35th	'34	Paul Wing, Jr., Chairman 12 Weston Road Hingham, Mass. 02043	Harborside Inn Edgartown, Mass.
30th	'39	Ernest R. Kaswell, Chairman 67 Paulson Road Waban, Mass. 02168	Wychmere Harbor Club Harwichport, Mass.
25th	'44	Burton Bromfield, Chairman 72 Woodchester Drive Weston, Mass. 02193	M.I.T. Campus
20th	'49	Stanley Margolin, Chairman 215 Grove Street Auburndale, Mass. 02166	Castle Harbour Hotel Bermuda
15th	'54	Robert D. Warshawer, Chairman 11 Tower Road Lexington, Mass. 02173	Jug End Inn South Egremont, Mass.
10th	'59	Allan S. Bufferd, Chairman 8 Whitney Road Newton, Mass. 02160	Not Selected
5th	'64	Robert H. Scott, Chairman 49 Jacqueline Road Waltham, Mass. 02154	Not Selected

Shapley graduated from Radcliffe College in 1967 and since then has worked as a reporter for the Quincy *Patriot-Ledger* specializing in urban affairs.

Alumni Calendar

Albuquerque—November 14, Thursday—Monthly Luncheon Meeting, Coronado Club, Sandia Base.

Boston—November 14, Thursday, 12:15 p.m.—Luncheon Meeting, Union Oyster House. Speaker: Charles W. Adams, founder and former President of Keydata, Inc. "Real Time Data Processing for Business."

Buffalo—November 12, Tuesday—Joint meeting with Rochester M.I.T. Club, Tour of Lapp Insulator.

Cambridge—November 9, 10, 11—Alumni Seminar (for alumni and wives). "Computers in the Service of Society." A series of talks, speculations and discussions by experts in many fields. Dedication of the Computation Center. Accommodations at Somerset Hotel, \$85.00 per person.

Long Island—November 1, Friday, 7:15 p.m.—Annual Dinner Dance, Roslyn Country Club. Dinner at 8:15 p.m., guest speaker.

Long Island—March 15—Eastern Regional Alumni Conference. Sponsored by the M.I.T. Club of Long Island.

Mexico City—March 13-15—Mexico City Fiesta, M.I.T. Club of Mexico.

Minneapolis—November 7, Thursday—Luncheon Meeting, M.I.T. Club of the Twin Cities. Speaker: Howard W. Johnson.

New York—October 22, Tuesday, 12:00 Noon—Luncheon Meeting, Rosoff's Restaurant. Speaker: Howard Morrison, Vice President and Director, Computer Applications, Inc. "How to Throw a Pass with a 360 Computer."

Northern New Jersey—November 14, Thursday, 6:30 p.m.—Dinner Meeting, Orange Lawn Tennis Club, South Orange. Speaker: Robert A. Albery, Dean of the School of Science. "A View from the Harvard Bridge—M.I.T. at the Frontiers of Science."

St. Louis—April 12, Saturday—Western Regional Alumni Conference. Sponsored by the M.I.T. Club of St. Louis.

Class Reunions—June 14-15, 1969.

Alumni Day—June 16, 1969.

The Institute prints a weekly Calendar of Institute Activities describing lectures and other activities which can be obtained at \$4.00 per year through the Public Relations Office.

Deceased

Arthur W. Pierce, '91, May 16
Raul de R. Carvalho, '92, 1967
Edward M. Hunt, '94, May 20
George Taylor, '94, July 11
Charles E. Batchelder, '96, February 8*
Frederic S. Atwood, '97, June 12
W. Charles Dunn, '97, April 23
Carl W. Sharer, '97, October 12, 1965
Albion W. Shaw, '98, January 27*
James D. Burns, Jr., '00, May 1, 1966
Jose H. Aguilar, '03, April 3
Frederick W. Farrell, '04, April 28
Howard Moore, '04, June 3
George R. Spalding, '04, April 19, 1967
Percy G. Hill, '05, May 8
George W. Perry, '05, June 21
Milton Latham, '06, May 11, 1967*
Mrs. James A. Beck, '07, July 7, 1966*
Arthur H. Jansson, '07, January 15
Myron M. Davis, '08, May 21*
Lester H. King, '09, April 21*
George Weinhagen, Jr., '09, May 16*
Allen Abrams, '10, August 9*
Frank L. Cobb, '10, April 18*
H. Norris Harrison, '10, April 27
Henry C. Perley, '10, June 4
M. Alva Zook, '10, June 16
Harry S. Alexander, '11, June 28, 1967
Charles R. Strong, '11, March 4
Raymond C. Foster, '12, June 13, 1967*
Michael W. Murray, '12, June, 1967*
Frank L. Ahern, '14, July 3, 1967
Perley E. Conner, '14, April 16
Joaquin R. Masferrer, '14, December 24, 1953
Walter M. Africa, '15, May 5*
Ulrich C. Schiess, '15, May 15*
Stanley T. Barker, '16, August 2
Clifford E. Shedd, '16, September 8, 1967
J. Justin Basch, '17, May 24*
Franklin B. Davis, '17, June 3*
Paul M. Flagg, '17, May 8*
Gilead D. Morse, '17, July 11
William H. Seymour, '17, July 11
George S. Murray, '18, February 29
Julius A. Buerkin, '18, June 11
Charles H. G. Gray, '18, June 19
Casimiro Lana-Sarrate, '18, May 5, 1963
F. Alexander Magoun, '18, July 7*
Arthur W. Pope, Jr., '18, May 9
Cutter P. Davis, '19, July 1
Earle E. Richardson, '19, July 4
Donald L. Dowling, '20, May 17
Lawrence G. Ropes, '20, June 26
Harold W. Stiegler, '20, July 25, 1967
John J. Winn, Jr., '21, March 28
Edward E. Bigelow, '22, February 14
Edson E. de Castro, '22, July 18
Paul W. George, '22, July 13
Fred C. Koch, '22, November 17, 1967
Samuel Patrick, Jr., '22, December 22, 1963
George P. Schumacker, Jr., '22, April 18, 1967
Dudley Tait, '22, December 25, 1967
Nelson M. Fuller, '23, May 1
Charles W. Gallaher, '23, August, 1967
Charles W. Springer, '23, June 4
Setrag Sulahian, '23, March 15
Walter W. Carlson, '24, September, 1967
Henry R. Harris, '24, November 10, 1967
Richard H. Russell, '24, December 24, 1967
Edward M. Sheehy, '24, April 1967
Henry F. Simonds, '24, April 22, 1968
Arthur S. Vaughan, Jr., '24, June 23
George J. Conway, '25, August 20, 1967

Albert M. MacCleery, '25, January 8
Rakenius J. Possiel, '25, July 9
Edgar P. Sorensen, '25, December 22, 1967
Avery H. Stanton, '25, August 3*
William C. Vose, '25, January 31, 1966
Robert F. Charles, '26, March 29
Nicholas J. Medvedeff, '26, April 4
Guy S. Frisbie, '26, June 22*
Walter E. Peterson, '26, October 16, 1967
Charles J. Slunder, '26, January 25
Natenis Kelly, '27, March 5, 1967*
Cole A. Armstrong, '28, June 2
C. Jerome Bitzer, '28, June 5
Norbert M. Milair, '28, July 6
George Muir, II, '28, July 21
Edward W. Clextion, '29, August 18, 1966
Charles A. Felker, '29, May 5, 1967
Arthur J. Williams, '29, March 30
Walter M. Graesser, '31, September 10, 1967
Richard S. Pollack, '31, May, 1965*
Dr. Harmon J. Truax, '31, May 3*
Wilmont H. Kidd, '32, March 16
Paul Seleen, '32, July 15, 1967
Norman S. Sinness, '32, February 13, 1964*
Harry H. Bell, '33, June 24, 1968
Dr. Gordon C. Pratt, '33, July 28
Allen M. Zollars, '33, February 9
Russel D. MacDonald, '34, May 15
Harry W. Englund, '35, June 17, 1967
Gordon E. Gott, '35, October 6, 1967
Dr. Frank J. Chiminiello, '36, June 12
Joseph L. Fratus, '36, January*
Max Goren, '37, June 17, 1967
H. Clifford Graves, '38, April 29
Miss Dorothy B. Phelps, '38, April 24, 1966
John A. Wilson Jr., '38, June 16
William H. Wright, '38, February 8, 1963
Bernard B. Langton, '39, July 30*
Philip Lucas, '39, July 26, 1968
John H. Howard, '39, July 29
Eugene J. Mackey, Jr., '39, July 27
Walter G. Thomas, '39, June 4
John F. Martin, '40, March 12
Russell D. Winslow, '40, June 23
Richard E. Joyce, Jr., '41, February 22, 1967
Anthony J. Cinquina, '45, August 8, 1964
Robert F. Carr, '47, September 16, 1967
Raymond L. Cleveland, '49, January
Kenneth R. Mellerop, '49, April 5
John C. Nygard, '49, June 7
Sumner Cohen, '50, March 19
Dr. Octavio Dias Carneiro, '51, May 10
Dr. David I. Sinizer, '51, March 3
James L. Conley, '52, May 31
John G. Beebe-Center, '56, January 1
Christopher Braybrooke, '57, October, 1967
Michael J. Adams, '59, November 15, 1967
Janis T. Andreika, '59, July 6
Walter A. Bagdade, '61, November 23, 1967
David J. Coker, '62, April 15
James T. Corless, '63, June 18
Paul T. Bailey, '66, December 23, 1967
*Further information in Class Review

\$2.875 Million from 18,771: A Record 1968 Alumni Fund

At least 11 records fell during the 1968 Alumni Fund before the books were closed on June 30; both of the year's totals—\$2,875,356 in gifts from 18,771 donors—represented new levels of Fund achievement. "There can be no more eloquent testimony to alumni awareness of the Institute's relevance to our times, to their desire to insure its constant progress, to their recognition of its role in their lives," said Howard L. Richardson, '31, Chairman of the Alumni Fund Board, in his annual report.

Other Alumni Fund records of the year:

1. Alumni Fund participation by the Class of 1943 was 54 per cent—a record for a 25th reunion class.
2. The 383 donors to the Class of 1928 40th reunion fund yielded a five-year participation record of 85 per cent.
3. The Class of 1918 broke three records for a 50th reunion class: 79 per cent participation in the last year of the five-year campaign, 96 per cent participation over the five-year period, and bequests to the Institute from 13 per cent of the class.
4. The Class of 1908 gave a total of \$62,845, a new record for a 60-year reunion fund.
5. Sixty-six per cent of the Class of 1913 participated in their reunion fund, a new record.
6. The 35-year Class of 1913 produced a new record when 50 per cent participated in the reunion gift.
7. A total of \$69,185 from the 20-year Class of 1948 was the highest ever recorded at a 20-year reunion and the highest ever given by a class less than 24 years graduated.
8. With 52 per cent participating, the Class of 1949 set a new record for classes graduated less than 25 years.
9. The Society of Sloan Fellows, former members of the Executive Development Program in the Sloan School of Management, recorded a total of \$29,545 from 61 per cent of the members—both new records, the total of gifts up 32 per cent over 1967, up 300 per cent over 1965.

More than 2,000 alumni worked as volunteers on the 1968 Alumni Fund, as class and regional officers and solicitors. Gifts of 1,187 alumni to the 1968 Alumni Fund were matched by their employers—159 companies—who gave a total of \$102,989. The comparable figures for the 1967 Fund were 158 companies matching 1,048 alumni gifts with \$91,973.

In five consecutive record-breaking years, since 1964, the Alumni Fund has pro-



The largest telethon in the history of the Alumni Fund took place in New York last spring. Of the 537 alumni reached, 279 gave—many for the first time.

gressed from \$968,880 from and 14,971 donors, according to Mr. Richardson. Its performance, he said, represents "a record of accomplishment equalled by few other universities."

Long-Range Plan: A Major National Award

The Ernest T. Stewart Alumni Service Award, most prestigious prize of the American Alumni Council, was given to the M.I.T. Alumni Association this summer during the Council's annual conference in Miami Fla. The award, made annually for "outstanding service rendered to an institution and to the cause of education by organized alumni effort," honored the Association's two-year self-study project which culminated in the report of the Committee on Long-Range Planning.

Judges for the competition noted that "the exemplary excellence of the report extends its application beyond the Institute. In the broadest sense, the work of the Alumni Association's diligent leadership offers a renewed opportunity for students, faculty, trustees, and alumni 'to mobilize behind education the full strength of organized alumni support.'" The Long-Range Planning report, said the judges, recognizes that "alumni activity will have increasingly greater significance to its institution and that only through thorough self-study could the Alumni Association be sure that it is properly structured for the future." Thus, said the judges' statement, "the Alumni Association of M.I.T. is honored for its efforts in preparing an agenda for advancement."

John A. Lunn, '17, was Chairman of the Long-Range Planning Committee; the American Alumni Council's award was accepted in his behalf by Donald P. Severance, '38, at the Council's annual meeting in Miami.



The silver bowl, emblematic of the American Alumni Council's Ernest T. Stewart Alumni Service Award was handed to John A. Lunn, '17, who was

Chairman of the Long-Range Planning Committee by Arthur J. Horton, Secretary of the A.A.C.'s Board of Directors. (Photo: Owen D. Franken, '68)



Increasing social consciousness characterized the M.I.T. campus in 1967-1968, Kenneth R. Wadleigh, '43 (right), told members of the Alumni Fund board during

Alumni Fund Board: Students In Search of Identity

When M.I.T. students discussed with him their plans to protest the Dow Chemical Company's role in the production of napalm during Dow's campus visit last fall (see *Technology Review for December, Pages 54-55*), Kenneth R. Wadleigh, '43, Dean of Student Affairs, set down two basic principles by which the students should be guided:

1. M.I.T. recognizes that responsible dissent is important in a democracy.
2. Every university must provide an education for each of its students; so M.I.T. must protect the right of all its students by assuring them free access to the Institute's educational facilities.

The result, Dean Wadleigh told members of the Alumni Fund Board at their annual meeting late last spring, was a basic understanding between students and administration which then persisted throughout the year. But whether these open communications can be maintained in the future was a question upon which he would not be committed. "The tenor of the campus is getting to be much more typical" of American higher education, Dean Wadleigh said, though there remains at M.I.T. a "generation gap" between upperclassmen and Freshmen. Younger students especially, he told members of the Board, feel real concern for how they may be able to affect and influence "this highly complex, mechanized, technological society, how to be a person, how to have influence."

Gradually, he added, "disillusioned and concerned students are discovering that there is a way to affect the nation after all," and more and more M.I.T. students are moved by the social and political issues which confront the U.S. In response, Dean Wadleigh said,

their annual meeting at M.I.T. last spring. The student body is "finally coming up to date," he said, though there is still a "generation gap" between upperclassmen and Freshmen.

it is the Institute's policy to "encourage active social and political participation" on the part of all students. But the Institute also emphasizes that as M.I.T. students they have "no special rights and privileges," he told the Board.

Tokyo: Japanese Alumni Meet

Norman J. Padelford, Professor of Political Science at M.I.T., and Mrs. Padelford were the guests of honor at the M.I.T. Association of Japan banquet on May 7, 1968. Professor Padelford spoke to the group on some of the new developments taking place at M.I.T., especially touching on the Ocean Engineering Program, a subject of special interest to members of the Club in view of Japan's position in ocean affairs. Also mentioned were some of the changes that have been occurring in student attitudes relating to political issues.

Mrs. Padelford was asked to speak about the M.I.T. Host Family Program. One of those in attendance had returned only the week before from Cambridge, where he had had a happy experience with a host family. Much appreciation was expressed by members of the Club for what M.I.T. has been doing through this program to help Japanese students adjust to living in the States.

Los Angeles: Picnic and Opinions

The seventh annual undergraduate picnic, hosted by the M.I.T. Club of Southern California for incoming freshmen and students from the Southern California area, brought 60 undergraduates and alumni to the home of Ivan A. Getting, '33, this summer. Charles M. Edwards, '40, recently appointed Chairman of the Southern California area Educational Council, planned the picnic and program. Following dinner

on the patio, the group gathered at poolside for a "nuts and bolts" session on the Institute environment. Colonel Philip Schwartz, '23, solicited student opinion on the effectiveness of the Club's Summer Job Program. Undergraduates responded enthusiastically and unanimously requested that the Club continue the program for the coming year.

M.I.T. Club of Boston: 1968-1969 Club Season Begins

John D. Stelling, '56, President of the M.I.T. Club of Boston, has announced an ambitious program of monthly luncheons and special dinner meetings for the 1968-1969 year. The purpose, according to his announcement, is to enable members to meet fellow alumni and classmates and to hear outstanding speakers from government, industry and education present significant viewpoints on current topics.

Charles W. Adams, founder and former President of Keydata, Inc., and Adams Associates, pioneer in the field of real-time data processing for business, speaking at lunch on November 14, will discuss how computer timesharing by geographically scattered users is allowing even small firms to connect to large scale computers.

Esther W. Marvin: 39 Years of Service

Esther W. Marvin, secretary to the Executive Vice President of the M.I.T. Alumni Association, retired in June after 39 years of service at M.I.T. including 18 years with the Alumni Association.

Miss Marvin came to the Institute as a member of the Letter Shop staff in 1929; she was on leave as a member of the U.S. Navy from 1944 to 1946, when she returned to join the office of the Dean of Students. Her affiliation with the M.I.T. Alumni Association began four years later, in 1950.

Milwaukee: Bob-O-Link Farm Picnic

Cool but pleasant weather permitted a variety of activities at the Bob-O-Link Farm where Mrs. Ella D. Laub, mother of Ray Laub, '60, was hostess to the 1968 picnic of the Milwaukee M.I.T. Club on Sunday, August 25. Prior commitments by many club members and students kept the attendance down to seven families and four students, a total of 27. The Club's experiment with a noncatered affair was a great success. Plans to achieve greater participation by both members and vacationing students are being formulated for next year's program.

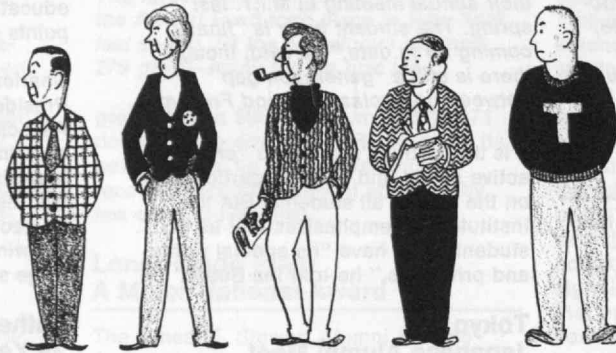
Kane on M.I.T.

FALL FASHIONS

... A few reasons why so many MIT students ARE!



With Freshmen the word is basic gray



By contrast, fraternity press gangs favor unmatched coordinates in smart stripes, twills, and solids

Accessories Note:
Book bags are back ~
but conformity is out



The Establishment



The Traveler



The Coop Special

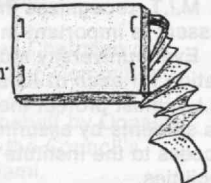
One Barber
No Waiting

HIRSUTE is still the word



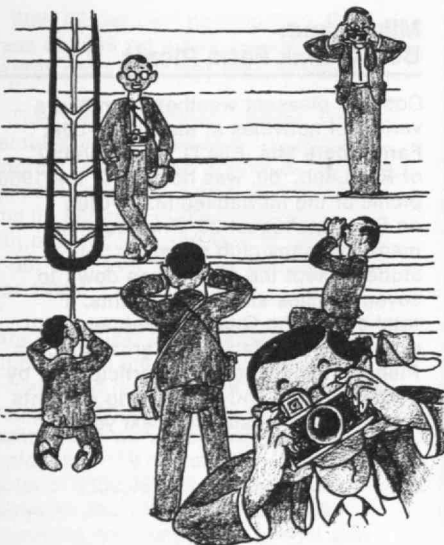
(Freshman type)

The Computer Age

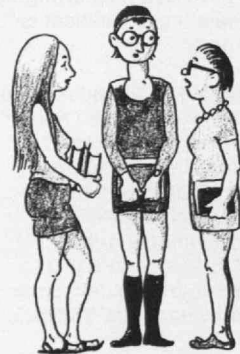


Nehru jackets have few adherents ~

Footwear note:
Sandals, sneakers, and
desert boots are NOW



As usual, Natives of the Far East come with cameras as standard equipment



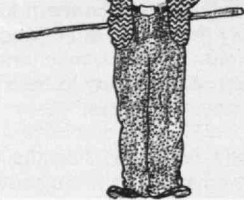
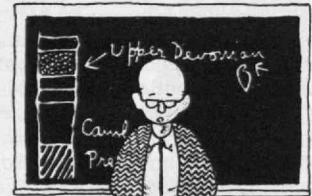
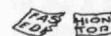
"Midi-skirt" is a word still unknown to women students



especially among Indian students



"In general I would say the average student dresses in the tastefully understated MIT way ~ his wardrobe runs the gamut from A to B"



And the New Look in Faculty circles? ~ the Old Look/

H-B-KANE

Class Review

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It was a real pleasure to attend the meeting for Class Secretaries on June 10 and to meet the staff of the *Review*. I was especially pleased to be able to visit with Jim Driscoll, as we had sat next to one another at the M.I.T. Alumni Council Meetings for many years.

Special thanks to Don Severance, '38, who, despite his very busy schedule, stopped by for a visit. I was delighted to see him.—**Andrew D. Fuller**, Secretary, 1284 Beacon Street, Brookline, Mass. 02146

96

Notice has been received from the Alumni Office of the death of **Charles Eildermann Batchelder** on February 8, 1968. After graduation, Batchelder joined J. D. Batchelder Company, a wholesale flour and produce business and became a partner before the firm liquidated in 1919. He had made statistical studies of the stock market and for a while was an active trader. His son, Dean, M.I.T.'28, Course VI, received his master's degree in electrical engineering from Cal Tech and remained in California doing highly secret research. In 1947, Charles and Mrs. Batchelder moved to California to be near their son and his family, and settled in Palm Springs for eight years. They then moved to Santa Ana where he continued to enjoy playing the piano every day and doing some composing which was not published. In one of his letters he wrote: "We have a gardener, but I still do all of the watering which gives me some of the exercise that I need." At that time he was still driving his Cadillac. The Class extends its sympathy to his family. . . . Alumni Day Luncheon was in the John A. Rockwell Cage. The Class of 1898 was represented by three members who sat at the table with 1896. The Secretary of '96 sat beside Professor Riley, '98, who asked for news of **Walter S. Leland**, with whom he had walked through the White Mountain area when they were both teaching engineering. Word had just come from

Walter S. Leland's son, Robert, that his father had died May 31, 1968. The Class of 1896 extends its sympathy to the Leland family. An interesting letter from Robert Leland contained the following: "Sometime during the summer of 1906, as the story has been told to me, Joe and Walter were walking through the White Mountains in the general direction of the town of Bethlehem. According to the tale, at each fork of the trail the two young men flipped a coin to decide whether to go left or right. On two or three occasions when this decision was necessary, Walter won the toss. Finally, upon arriving at Bethlehem there were two boarding houses available at which they might stay for the night. One had a bevy of pretty girls sitting on the veranda, and as the story goes, Joe Riley was not about to lose another coin flip. He flatly told Walter, I am tired of losing. We are going to this one. Now it just so happens that one of those pretty young girls later became my mother. I certainly do not know what I would have done without Professor Joe Riley! . . . "As to a very brief history of my father's activities, for those who might be interested, after spending some four years working for the Navy both on the East and West Coasts, he taught in Course XIII at M.I.T. until 1912 at which time he returned to California, first spending a short while involved with the design of the special sand dredge that was used to fill in the site of the 1915 World's Fair in San Francisco. There followed a period of almost 50 years of more or less continuous activity as a contractor and mechanical engineer designing and constructing steam boiler plants, this in spite of the fact that a damaging siege of glaucoma in 1921 seriously impaired his vision and finally, after 22 years, left him sightless. . . . "In spite of his blindness, he always kept up with the latest news via the radio and in later years with the aid of a record player and a service known as "Records for the Blind," audible versions of *Reader's Digest* and many other periodicals, as well as interesting books. There just must have been something indomitable about those M.I.T. boys. . . . My best wishes to the remaining members of the Class of 1896."

At the reception for the Class Secretaries on Alumni Day, Andy Fuller, '95, was most gladly welcomed. He said he intended to write his class notes for the coming issue. **James M. Driscoll**, Secretary, 129 Walnut Street, Brookline, Mass. 02146

98

The 70th Reunion Luncheon on June 10 was very enjoyable to the four of us. The three classmates who attended were **Fred Dawes**, **Bob Lacy** (for several days!), and **Joe Riley**. These three were asked to stand to be recognized, the only "special year" to be thus honored. James R. Killian, Jr., '26, Chairman of the Corporation and past President, walked around our table to greet each one. We were seated immediately in front of the head table. Because of inclement weather, we were inside Rockwell Cage at round tables, sharing ours with one member of 1897 and one member of 1896. The speech of the President, Howard Johnson, was excellent, and I am sure it will be reported elsewhere in *Technology Review*. We were sorry that the others of '98 could not be with us.

Regrets and best wishes were received by mail and read from **Joseph Ames**, **Allen Curtis**, **Alvan Davis**, **Lyman Hewins**, **Edwin Kuttroff**, **Mrs. Mabel Forrest Lambert** and **Willard Nelson**. **George Newbury** in North Carolina, and **Walter Page** in Pennsylvania, did not write but perhaps they felt it was too long a trip. . . . A sad note here—Mrs. Shaw wrote that her husband, **Albion W. Shaw**, retired from electrical engineering, died on January 29, 1968. Earlier that same month in the 1898 Class Review you remember reading that he was confined to his house. She wrote, "I expect the leg caused the heart trouble." On May 16 I replied with a letter expressing sympathy from the Class.

Also In Memoriam: **James Purdon**, Course IV Architecture, January 4, 1966. He was graduated from Harvard in 1895 and then went to M.I.T. His daughter, Nina, wrote that he had been ailing in a nursing home for several years. Although he attended M.I.T. for

only one year, he was listed in the Alumni Register as a class member of 1898.—**Audrey Jones Jones**, Acting Secretary, 232 Fountain Street, Springfield, Mass. 01108

99

On Alumni Day, **Carroll W. Brown**, his son William, '33, **Percy W. Witherell**, and Mrs. Richard H. Witherell, wife of Richard, '49, were seated directly in front of the presiding officer.—**Percy W. Witherell**, Secretary, 1162 West Street, Wrentham, Mass. 02093

02

Our only representatives at the Alumni Day exercises were **Arthur** and Mrs. **Collier**. The older classes were few in number at the best. . . . A backward look—while rummaging among a lot of old souvenirs I came across a copy of the "Student's Hand Book of M.I.T. 1898-90 published by the Y.M.C.A. of the Institute." It contained in the front a folded map—on one side a much reduced street map of Boston and on the other side an enlarged detail of the area near the Institute. You may remember this little red book as each freshman received one. The inside pages give much miscellaneous information regarding the activities of the student body, heads of the departments, etc. The calendar for the school year is of interest. The school year started Wednesday, September 28, 1898. At Thanksgiving there were three days of vacation and the same at Christmas. Semi-annual examinations ran January 17-28 and the second term began February 7, 1899. Washington's Birthday was observed as a holiday, and the spring vacation was a lengthy three days, April 19-21. Final exams were in order May 23-June 3. Advertisements in the back of the book cover a large variety of things from pianos to rent to drawing instruments to meals, haircuts, etc. Priest's Dining Rooms offer a "Full Ticket" (21 meals) for \$4, and Robert W. Jackson offers "Trousers Sponged and Pressed/8 Pairs for 50 cents." Compare with 1968.—**Burton G. Philbrick**, Secretary, 18 Ocean Avenue, Salem, Mass. 01970

03

Well, classmates, our epochal 65th M.I.T. Reunion reached beyond the pinnacle of our expectations. The fortunate group of us remaining—fifty members who parted on our graduation to distant realms—can now retire in blissful relaxation and reflect on the many incidents that transpired during our long chosen professions. The absence of many classmates from our noted Reunion is sad but not surprising, considering the maturity of our classmates; but both the reunion spirit and the many letters received by your Secretary show an increase in loyalty to M.I.T. as years



A. E. Place, '03

advance. . . . But the absence of a few local classmates was somewhat disappointing. **Gus Eustis**, our long-faithful Treasurer, had to attend his yearly corporate meeting at his factory in Norfolk, Va. **Ike Atwood**, our counsellor, belongs to a Canadian Fishing Club that yearly gathers for best angling, his avid enjoyment. **Stan Foster** writes that he wishes to be remembered to the boys and is now a little unsteady on his feet.

This reminds us of the humorous remark of Proxy Cross, when some students manifested their approbation by shuffling their feet: "A little more activity at the other extremity, gentlemen, might tend to develop it proportionately."

I talked with **Charley Griffin** by phone recently, and he is enjoying his retirement but his eyes are now causing him some delay in his customary chores. The usual fine weather that so long accompanied our alumni festivities was rudely shattered on Alumni Day. The torrential rains that continued through the day surely dampened the spirit of the entire throng assembled. And the spirit of our early Class Secretaries was further dampened by the absence of many of their classmates, so we formed a combined table, with class cards assembled, to enjoy each other and discuss the heavy burden of acquiring our class news for the coming *Review*.

When our generous meal was half completed—my hopes for late arrivals unabated—I was delighted to have **Bob King** with his gracious wife and Mrs. Leroy Gould as guest suddenly arrive, after a long auto trip from Connecticut. Our '03 card was restored to our regular table and we soon resumed our joyous sharing of news since last meeting. We lingered after the meal for more news and, abundant thanks to Mrs. Gould's son, Gilbert, M.I.T. '43, VI, and his desire to provide for our group, a series of excellent photos were taken which, fortunately, became the souvenir for posterity of our 65th Reunion. Due to the severity of the afternoon rain, we chose to forego the customary re-

freshments and newly required dancing within the Armory. So after our farewells, **Bob King** and his group could then resume their long auto journey homeward more safely in daylight.

John Dooley, VI, writes of the recent passing of his devoted wife, who was present with him at our 60th. He is now endeavoring to adjust his plans by spending six weeks at his son's home in San Mateo, Calif., but with future plans uncertain. . . . The present fine picture of our classmate, Adolph Place, which appears in this issue was delayed for publication in our last *Review* but is now an appropriate footnote to his interesting autobiography. . . . Our **Clarence Joyce**, V, with his enthusiastic wife Mildred, has again enjoyed a European trip: arriving at South Hampton, England on June 21, stopping at the English Speaking Union, London, for a fortnight; then flying to Geneva for two weeks; next to Montreux and then Paris, France for another two weeks and finally returning home, 31 Crescent, Montclair, N.J., on the New Amsterdam from Rotterdam by August 16.

A sombre note from our devoted classmate **Jymall Cheney**, II, of Wilton, Conn., discloses the sad news that his long-faithful wife and companion, soon to celebrate her 82d birthday, passed away March 12. He is gradually regaining his normal status and is most thankful for his continued good health. He recalls his enjoyment at our 60th Reunion, but under the present duress he regretfully passed by our celebration this year. . . . **William C. Lonsbury**, VII, has a new address—Nazerath House, 814 Jackson Street, Stoughton, Wisc. Our Happy Birthday news item has been greatly missed of late, though obituaries are still present. . . . So in closing, classmates, a plea for your reminiscent news; send it to your Secretary; "the strong flow of a river needs the cooperation of many tributaries."—**John J. A. Nolan**, Secretary, 13 Linden Avenue, Somerville, Mass. 02143; **Augustus H. Eustis**, Treasurer, 1428 Canton Avenue, Milton, Mass. 02186

04

Alumni Day, June 10, was attended by several members of the class of '04. Those present were Mr. and Mrs. **Maynard Holcombe** from Florida, Mrs. **Hayward, Harry Kendall** and your treasurer. It wasn't very pleasant weatherwise and umbrellas were the order of the day. All events were held inside. It was pleasant to see those present and to be at the M.I.T. events of the day. . . . We report the passing of two '04 wives—Mrs. Daniel F. Comstock of Cambridge and Mrs. Reginald Wentworth of Pennsylvania.—**Eugene H. Russell, Jr.**, 82 Stevens Road, Needham, Mass. 02192

05

Of course, the important bit of news, although a bit time-worn, is in regard to our 63d Reunion at the Alumni Luncheon on Alumni Day. It was a grand success socially and gastronomically, and from a comparative standpoint numerically. At least our attendance was more than "nearby" classes. Present were **Leonard** and Beatrice **Cronkhite**, **Gilbert** and Elizabeth **Tower**, Elizabeth **Babcock**, Mildred **Stevenson**, **Doc Lewis**, **Hub Kenway**, **Art Balkam**, **Herman Gammons**, **Izzy Nye**, **Gil Joslin**, **Harry Charlesworth**, **Bert Files** and daughter **Josephine** and **Ruth** and I. From **Tower** I learned that at the last Town Meeting at Cohasset he was elected a member of the Planning Board. He is now working officially on planning work, which he previously had done for several years voluntarily. **Gib** had written me of this a couple of months before and I had carelessly lost his letter in writing up previous class notes. The May 10 issue of the *South Shore News* has a half-page map showing **Gib's** plan for the Cohasset-Hingham end of the proposed new Route 228-Boston to the Cape.

Doc Lewis humbly mentioned that he was still on Humble Oil's retainer list. **Kenway** and **Gammons** reported that they are at their respective offices three or four days a week. **Izzy Nye** says he's still on the job daily, although from post cards we get, he apparently spends some time recuperating in the White Mountains or the Carribean. **Harry Charlesworth** still drives frequently from his home in New Jersey to his farm in East Kingston, N.H. He emphatically reminds me that the farm is in New Hampshire, not Newbury, Mass., as I have apparently mistakenly stated a couple of times. . . . Mildred **Stevenson** and Elizabeth **Babcock** attended the Memorial Service for M.I.T. Alumni held each year at the M.I.T. Chapel, memorializing the alumni who have been reported as deceased between June 1, 1967 and June 1, 1968. The '05 men were **George Barrows**, **Emmet Dwyer**, **Lawrence Fuller**, **Myron Helpen**, **John Lynch**, **Willard Simpson**, **Converse Smith** and **Winfred Taylor**. . . . On

June 22, **Ruth** and I attended the Golden Wedding Anniversary of **Prince** and **Ethel Crowell** at Woods Hole, Mass. The attendance proved that they were dearly worshipped by the townspeople as well as many from all over the U.S.A. Both seemed in excellent health. **Prince** was his usual exuberant self, said he wore as much of his original wedding suit as had survived the borrowings for all kinds of entertainments, plays, socials, etc., over the 50 years. **Ethel** wore her original wedding gown, "which doesn't quite come together in back."

While on the Cape (Cod, of course), we visited **Bill** and **Peg Ball** at Cotuit. They were very much perturbed because **Bill** was facing surgery for a detached piece of retina, the discovery of which had been bothering **Bill** since his return from Florida. While in Florida they had sold their Cotuit house, with an agreement to vacate on a certain date, which turned out to be the day later determined on for surgery. This double emergency might have been disastrous but for **Peg's** "cool" and the help of kind neighbors. A few days ago I had a note from **Bill** which stated that the operation was successful, that he would be "in the dark" for quite a while. Let's hope that by the time you read this, **Bill's** sight will have been fully restored. Incidentally **Bill** and **Peg** will reside in Florida permanently. . . . On Alumni Day **Gil Joslin** told me that **Henry Buff** was in a nursing home in Boston. Just now I have been talking with **Henry** and found him ambulatory and in comfortable circumstances. Because **Henry** was in his usual talkative frame of mind—"Yes and no, etc." I gather that he is well (considering) and as happy as one can be in even the very best nursing home. Along similar lines, **Helen Kenway** (Mrs. **Hub**) tripped, fell and broke her hip early in May, was confined to the hospital for two or three weeks, then in a nursing home for two months and at last returned to her home in Newton just recently. She "gets about a bit" with a "walker," but for the first time in many years may miss life on the Farm (Franklin, N.H.) this year.

One night recently an out-of-town friend stopped at our door to deliver a package, "Which should interest some M.I.T. man." On opening it I found a 1904 *Technique*, which said friend had found in the ruins of an old house in Alton, N.H. I would have sent it to my friend, **Gene Russell**, for his memory rack, but for the fact that it was one third mold, one third dust, one third dead leaves. There was no identity but perhaps **Gene** would like to "take it from there." . . . I have read with great interest an article in the *American Oxonian* (April, 1968) by **Leonard W. Cronkhite** entitled "A Look Forward." It is a sequel to a previous article (July, 1967) and both were written to arouse the reader to the continuing threat of Communism in the U.S.A. It is a powerful and very

interesting article, but just how to tell you how you can read it, I do not know, unless you write **Len** (5 Concord Avenue, Cambridge, Mass.) Incidentally, in a letter from Mrs. **Cronkhite**, received this morning, I learned that after **Leonard** had passed successfully a thorough physical exam, with "patient should be considered as twenty years under his chronological age," post-script, X-rays taken at the time suggested further X-rays, resulting in surgery. He is back home with the caution that for a few weeks he must cut down on his usual activities. We can all hope that when you read this, he will have returned to his "twenty years younger" status.

Hazel (Mrs. **Warren A.**) **Wells**, writes: "Warren does well in keeping diabetes and glaucoma under control but as he faces his 87th birthday he doesn't have too much pep! For your 'happiness' wish, we are very thankful to be getting along as well as we are, and to be in a place we like so much. Of course we are going to have to sell when we can and what we will do then is 'on the knees of the gods.' At any rate you will know that we have made our last long trip to any reunion. So sorry we could not have been with you last June but my 55th at Northwestern seemed all we could manage; the 2,900 plus miles was quite a bit for me to manage." . . . I wish I could tell you completely and accurately the **Dorothy** and **Fred Poole** story of the last several years. **Dorothy** is an acknowledged national authority on shells and fossils (see *Philadelphia Bulletin* of June 27, 1968). **Fred** has been a constant bird-watcher for a score of years. I remember when he called me up in Boston from some point in Maine and said, "Fred, I have discovered the nest of a pileated woodpecker. If you come down right away, you can watch the birds." Guess I had a chance to sell a pump and didn't make it. Together they have compiled sufficient material to make three hour-long films with scripts, "Nature Secrets," "Swamp Land Secrets" and "Sea Shell Secrets." **Dorothy** is a Fellow of Comstock Society and **Fred** a Fellow of the Delaware Valley Ornithological Society. **Fred** has in manuscript form a book, *Birding Tips for Adult Beginners*, ready for the press. I am sure that anyone in their vicinity or travelling through would enjoy visiting their museum. The address is 17 North Girard Street, Woodbury, N.J.

I have to report the deaths of **George W. Perry** of East Weymouth, Mass., on June 21, 1968, and **Percy Granville Hill** of Ridgewood, New Jersey on June 28, 1968. I have been promised newspaper obituaries for the next issue. I learned that **Emmet Dwyer** of Grosse Point, Mich., died on Dec. 12, 1967. In an attempt to get a newspaper obituary I was reminded, "We have no newspapers in Detroit."—**Fred W. Goldthwait**, Secretary, Center Sandwich, N.H. 03227

You will all be pleased to know that in accordance with the class vote taken during our last reunion, the 1906 Memorial Fund has been in operation since last May, after the three Class Officers had conferred with Kenneth Brock, Director of the Alumni Fund. The formal document, signed by the three Class Officers, contains seven items, the first one being: "It is proper for Alumni Fund donors from the Class of 1906 to designate their contributions for the Class of 1906 Memorial Fund." So please note and remember that your gift is to be designated. Our Memorial Fund starts with a total of about \$20,000.00 and Item 4 specifies that: "Future contributions from members of the class, or in memory of a member, are to be added to the principal of the Memorial Fund and also one half (50 per cent) of the annual income it earns. The other half is to be used by the Alumni Fund—unrestricted but preferably for scholarships. The last two items provide for the eventual termination of the Fund and disposition of its assets by the Alumni Fund Board or Treasurer of the Institute. Scholarship funds have been so important for so many years. In 1907 it was proposed that a fund be set up the income from which would cover class expenses and so abolish class dues. When said fund was no longer necessary for such use, the same would be given to a Scholarship Fund of the Institute. That plan did not get beyond the "proposal" stage, but your treasurer has an adequate amount of class funds in a special savings account to cover all expenses, SO—please send no more class dues. . . . Alumni Day was, as you know, on June 10 and who do you suppose occupied the '06 table at lunch?—it was just the regulars—the **Chases and Rowes, Bill Abbott and Walter Davol**. During the lunch, as I had hoped, we had the pleasure of seeing and holding the silver Friendship Medal which had been presented to our Class President, Sherm Chase, at the Cleveland meeting of the A.W.W.A. (American Water Works Association) by the president of the British Institute of Water Engineers—their first such award. Bertha had sent us a card from Cleveland reporting the presentation "and great enthusiasm"—a beautiful medal and an outstanding and well merited honor.

The death of **Guy Ruggles** and **Sam Greeley** were reported in the May notes. Since then I have received numerous clippings of their obituaries through the Alumni Office, likewise that of **George Burpee**. Sam was an honorary member of A.S.C.E. (American Society of Consulting Engineers) and "a nationally known figure in the sanitary engineering field." He was resident engineer during the construction of a large refuse incinerator plant in Milwaukee in 1908. (And how they are needed today). Soon after that he was in charge of an investigation for

water supply and sewage disposal for Caracas, Venezuela; in 1912 he was assistant engineer for the Sanitary District of Chicago. It is interesting to speculate how much disease—even how many deaths—may have been avoided as a result of Sam's life-long work in the field in which his firm specialized, during which he received numerous awards, medals, and prizes, as well as honorary memberships. One obituary of George Burpee had evidently appeared in the Bowdoin College alumni magazine and contained more details of his outstanding professional and civic career than I had possessed. It contained a citation read when he received an honorary doctor of science degree from Bowdoin of which he was a graduate and had been a trustee.

Did you know that the Institute went through a period when it nearly folded? Edward Weeks, Editor of the *Atlantic Monthly*, did a lot of research about "The Lowells, and Their Institute." One of the Lowells, Augustus, became a member of the corporation in 1873, "when it was in financial straits." There were lean years after the fire and "the retrenchments rendered necessary at that time came near destroying the Institute of Technology." The year before his death Augustus gave the Institute \$50,000.00 and a like amount in his will. That gift became known as the Teachers' Fund. There is much of interest in that book but I shouldn't take more space to quote. Why don't you get the book from your library soon. . . . Last spring came a welcome long letter from **Fay Libbey**, III, 2014 N.W. Glisan St., Portland, Ore. 97209. After 40 years of a happy married life his wife died in 1952. They had one daughter Rosalie whose husband, John Swanson, is a chemist with Battelle at Hanford and they live in Richland, Wash. For his career Fay referred me to *Who's Who in America* and *Who's Who in Engineering*, which I will consult if our library has them. After his retirement he was in consulting work for a few years, until he wasn't able to do field work. Since then he has been busy completing a mine report for the State Department of Geology. Fay has quit driving voluntarily and says he feels fairly well. We have also heard from **Walter Davol** and **Stew Coey** and early in August Mary (**Harry**) **Fletcher** phoned from Philadelphia. She and Harry expected to fly up later for their annual visit to Harry's home town, Portland, Maine. There are three deaths to report. **Milton Latham**, IV, died May 11, 1967 probably in Vallejo, Calif. He was born November 18, 1882 in San Francisco and until 1918 his name was Lichtenstein. He had prepared at California School of Mechanical Arts, was with us all four years and a member of the Architectural Society, California Club, Golf Association, and was in the chorus of that Tech play *The Scientific King*. Until 1915 I have only San Francisco addresses and by then he was an architect with an office on Ellis Street—later it was

in Carmel and after retiring, in Vallejo. We have no information about his family but the report of his death was sent to the Alumni Office by H. M. Latham, possibly a son. On November 9, 1967, **Leland Sargent Woodruff**, VI, died in La Jolla as reported to the Alumni Office by his widow in January. He was born September 19, 1880, in Round Prairie, Minn.; obtained a B.A. at Beloit College; was a member of the Electrical Engineering Society and Wisconsin Club; his thesis was on concatenation of induction motors. He soon joined the Allis Chalmers Company at West Allis, Wisc., stayed with that company until he retired in the early 50's and soon moved out to La Jolla. . . . **Willis Smith Cayless**, III, died March 16, 1968. He was born November 22, 1880, in Albuquerque, N.M., but his home address was Denver, where he attended the Manual Training School. While with us he was a member of the Mining Eng. Society and his thesis was on the composition of copper-iron mattes, with E. E. Harrington. He joined the American Smelting & Refining Company at the Pueblo plant in 1907 as assistant chemist and by or before 1910 was an assayer and chemist at Guanajuato, Mexico. In 1915, evidently between jobs, he was at the old home in Denver but he soon joined the Federal Lead Company at Flat River, Mo., and a few years later yielded to a yearning and moved out to Covina, Calif., to grow walnuts, retiring there around 1955 to live in West Covina.

If you have a 1906 *Technique* turn to page 305 where you will find an article among The Grinds entitled "The Merger with Wellesley." It was a joke then but 60 years later it became a fact, in a way, and it was Stanley Wires, '07, who brought it to my attention. I had forgotten the news release issued jointly on May 17, 1968, by the Wellesley Office of Publicity and M.I.T. Office of Public Relations which states that they "have agreed to explore a five-year experimental program, beginning in 1968, under which their undergraduate students may take courses in either institution. The purpose of the experiment is to extend the diversity of educational experiences now available to students in the curricula and the environments at both institutions." In our day we didn't need any official program to enable us to "merge" with the Wellesley gals, many of whom are married and living here in the Town of Wellesley.—**Edward B. Rowe**, Secretary-Treasurer, 11 Cushing Road, Wellesley Hills, Mass. 02181

07

Alumni Day, June 10, 1968, recorded only two '07 men in attendance. Your Secretary, **Phil Walker**, with his wife and **Louis A. Freedman**, II, represented the Class. Arriving shortly after 10 a.m., we attended the Memorial Service in the Chapel for those alumni

who had died since last June. There were 12 names on the '07 list. **William A. Young** had been inadvertently omitted and will appear in next year's list. All those attending the service received a brochure listing the names of the deceased by classes. The day was wet and dismal so the luncheon had to be held in "the Cage." We had part of a table with 1906 which was well represented. While the service by the waitresses was excellent, I missed the sea food and ices that Seiler always served. The speech making and bringing in of class gifts is an interesting part of the luncheon period. The value of the class gifts donated today is amazing. Due to the inclement weather and lack of '07 men to talk and visit with, your Secretary did not remain for the banquet and evening entertainment. I wrote a personal letter as Class Secretary and sent with it one of the obituary brochures to the families of the '07 men who had died this past year. I have had very appreciative replies from most of the families. . . . I had a notice in April of the death on July 7, 1966, of Mrs. James A. Beck who resided in Minneapolis, Minn. Upon inquiry, Mrs. Beck was the former **Isabel Worthington**, listed as a member of 1907 in Course IV. I had only remembered two coeds in '07, **Maude Darling** and **Lahvesia Packwood**. Maude married **Ray Parlin** of our Class and is living in Fall River. We recall her attendance at our 50th Reunion and 60th Class Banquet last year. Further search resulted in the information that Lahvesia did not receive a degree until 1909, and her name was continued by the Alumni Association as a member of that class. She was married to Stanley Udale, '06, and passed away on April 19, 1964. Her husband died the following June. I would appreciate receiving information about Isabel Worthington so that I might have some facts to include on her page of our Archives.

I was very pleased to receive a copy of the Barrington (Rhode Island) *Times* of May 18, 1968, and to read of the special honor that was given to our President, **Don Robbins**, at a dinner held at the Rhode Island Country Club on May 15, 1968. More than 70 alumni, their wives, and the immediate members of the Robbins family attended the affair which was sponsored by the M.I.T. Club of Rhode Island. For his services and lifelong dedication to M.I.T., Don was presented a silver Paul Revere bowl by Gregory Smith, '30, President of the M.I.T. Alumni Association. As a member of the Class of 1907, Don has served as Class Agent and Class President. He has been Secretary and President of the M.I.T. Club, President of the Alumni Association, Chairman of the Special Gifts Drive in Rhode Island, and a member of the M.I.T. Corporation. I regret to record that as I write these notes, late in July, Don is in the Rhode Island Hospital. He has had trouble with his back, and the doctors decided that special

therapy would be helpful. I have talked with him, and he reports real progress towards permanent improvement of his condition.

I had a note from Mrs. Elizabeth MacGregor Crooker early in June which informed me that our classmate, **M. E. MacGregor** had had a slight shock on June 9 which affected his speech and his ability to write. In previous Class Notes I had written of his selling his home on the Cape and moving to the Baptist Home on Commonwealth Avenue, Chestnut Hill. He went into the infirmary at the Home and has made a miraculous comeback. I called at the Home on July 10 and found that "Mac" could talk very freely but had not been able to write much as yet. No doubt this problem will clear up soon. I urge all of you to send him a card to Baptist Home, 66 Commonwealth Avenue, Chestnut Hill, Mass. 02167. He still is very optimistic about his 1968 trip to Mt. Washington. . . . A note received June 17 from the Alumni Register told of the death of **Rudolf H. Kudlich, II**, on April 1, 1968, at Camden, Maine. I wrote a letter of sympathy to his family and received a fine letter in return from his daughter, Jane. After graduation in 1907, he was employed by two anthracite coal companies as a mechanical engineer. In 1912 he joined the U.S. Bureau of Mines at Pittsburg. In 1920, Rudolf was transferred to the Washington office as Assistant to the Chief Mechanical Engineer; and in 1937, to the new Bureau of Mines Experimental Station at College Park, Md., as Superintendent. Later, as this station expanded, he was relieved of all administrative duties and devoted his activities to technical work concerned with maintenance and construction of plant facilities and design of special apparatus and equipment. Rudolf retired in 1954 and moved to Camden, Maine, where he and his wife lived at the time of his decease. He was a member of A.I.M.M.E. and with the National Safety Council had served on several committees and was the author of several technical papers. In Camden he was active in the Rotary Club and a member of the Episcopal Church.

Notices have been received about the Alumni Officers' Conference on September 6 and 7 on the Campus in Cambridge. I shall not attend this year, even though I can take my wife along also. I shall miss the good fellowship of the gatherings, but there will not be any other '07 men to associate with. . . . **E. Stanley Wires** has moved into a smaller house in Wellesley Hills. His new address is 367 Linden Street. I tried to get **Jim Barker** to stay over for Alumni Day, as I knew he would attend the Corporation Meeting on June 7 and also Commencement. He had a grandson being married on the 9th and so found it impossible to be with us. Jim is a very fine correspondent, and I appreciate his help with the Class Notes. . . . Fred Goldthwait, Secretary of

the Class of 1905, wrote me a nice letter of thanks for information I had given in the June Review about **Jack Kinnear** and **Albert Mansfield**, two old friends whom he traveled with during his undergraduate days. It is nice to know the '07 notes are read by other Tech men. . . . **Ken Chipman, III**, sent me a clipping from the *Ottawa Journal* of February 24, 1968, for his page in the 1907 Archives. It contains a very interesting account of Ken being attacked in 1912, by a grizzly bear whom he had disturbed when she was playing with two cubs. He received a badly torn knee and crushed foot. By "playing dead" he tricked his foe; the bear finally went off and left him. He joined the Stefansson Arctic Expedition in 1913, and spent three years in the old time Arctic "before the airplane made it a weekend resort." The Chipmans have one son William who is with the C.B.C. in St. John's, Newfoundland. Thanks, Ken.—**Philip B. Walker**, Secretary and Treasurer, 18 Summit Street, Whitinsville, Mass. 01588; **Gardner S. Gould**, Assistant Secretary, 409 Highland Street, Newtonville, Mass. 02160

08

Our 60th Reunion started at the Melrose Inn, Harwichport, Mass., on June 7, with headquarters at the Beach House as usual. The weather was perfect; **Howard Luther** and his daughter, who were staying at the Snow Inn, gave a cocktail party in their cottage for our crowd on Saturday afternoon, June 8. After dinner on Saturday night, **Joe Wattles** showed pictures taken at past reunions. It made us realize how many have since died. That evening, **Bunny Ames**, his daughter-in-law and her husband and friends visited us at the Beach House and told us about a recent trip to Ireland. After dinner on Sunday, the 9th, most of us started for Boston and Alumni Day at Cambridge the 10th. There we were joined by several classmates who hadn't been at the Cape. The following attended some or all of the doings: **Bunny Ames**, **Nick Carter**, **Harry Lord**, **Kennison** and his wife, **Wattles** and wife, **Sewell** and wife, **Joy** and wife, **Osborne** and wife, **Luther** and daughter, **Blackburn**, **Booth**, **Dexter**, **Loeb** and wife, **Norton**, **Sampson**, and **Towle**.

Am sorry to report the death of **Myron Davis** on May 21, 1968, in St. Petersburg, Fla., where he had been in retirement for the last 7 years. . . . The first dinner of 1968-1969 season was held at the Faculty Club on Memorial Drive, Cambridge, on October 9, at 6:30 p.m. . . . The following from **Jimmie Burch** will be of interest. . . . "Having attained my 80th birthday on December 21, I decided I had worked long enough and requested that I be relieved of any further responsibility for the operation of the bank and the fifty million dollars of other peoples money. . . . For its size it has had a fantastic growth, starting from scratch in 1935 with 676 banks in

Iowa preceding it, and now ranking twelfth in deposits in the State. However, I shall continue as an Honorary Director and coast along for a while. On January 6, 1968, the Bank Directors honored me with a testimonial dinner at the golf club. It was certainly a surprise party in one respect. When Marie and I arrived at the scene, daughter Mary Juno Patton and grandson Frank Patton, who had just flown in from Chicago, met us at the entrance. Then Nikki and husband Harold Babbitt from Shaker Heights, Ohio; James Merrill and wife Marcia, from Iron Mountain, Mich.; and finally Mary Patton, the youngest, from Manchester, Iowa, who lives with grandparents Patton and was a Page in the last session of the Legislature, met us.

"I was flabbergasted. Unbeknown to me the bank had flown them all in, and Marie, who was in on the deal, had put them all up at the motel. All the Directors and Officers and their wives were present, making a party of about 100. Frank took the part of toastmaster. No watch this time, but a concert version of a Magnavox Color Television, a fitting layout for Carnegie Hall.

"I was sorry to miss the Reunion this year but I didn't want to appear with a Band-Aid on my head. I had tripped on the cement steps at home and a growth appeared under the bruise which had to be removed before it would heal. It is OK now, just the scar left. . . . You can now address me as Great-grandpa as my oldest granddaughter, Nikki, who was at the 1965 Reunion with me, produced a 9-pound 1½-oz. boy at University Hospital in Cleveland at noon, June 8. We received a three day picture of him today which looks quite mature; he has a no-nonsense look."—**H. Leston Carter**, Secretary, 14 Roslyn Road, Waban, Mass. 02168; **Joseph W. Wattles**, Treasurer, 26 Bullard Road, Weston, Mass. 02193

09

There were only seven of us attending Alumni Day—**Chet Dawes**, **Tom Desmond**, Ed Howe, '10, **Ben** and Barbara **Pepper**, **Art Shaw**, and **George Wallis**. We all regretted the absence of Margaret Davis, Alice Desmond, Betty Shaw, and Marcia Wallis, who have always attended so regularly but were unable to come this year. The luncheon, held in Rockwell Cage, was under the auspices of the Alumni Association. It was most encouraging to hear the announcements of the large increase in the Alumni Fund and the generous gifts of the three anniversary classes: 1918 (50th year); 1928 (40th year); and 1943 (25th year), descriptions of which will be found in the July/August *Review*.

At the conclusion of the luncheon Art called an informal class meeting to decide on the meeting place for our Sixtieth Reunion which occurs next

June. As will be recalled, the class members have already voted on their preferences and the results, with discussions of the Reunion, have appeared in these notes. Since the Class had already shown preference for the campus and because of the convenience of being right at the center of activities thus eliminating any driving, we decided to select the campus for our meeting place. The tentative plan is to have a simple reunion. We have informed Fred Lehmann, '51, Alumni Secretary, of our decision and he writes, in part as follows: "We shall reserve sufficient space for you in the M.I.T. dormitories for your reunion. I have tentatively marked your Class for McCormick Hall. The program we discussed was for your reunion to begin on Sunday afternoon, June 15th, 1969, and to continue through Alumni Day and evening on Monday the 16th. We also agreed that you might wish to begin the Reunion a day earlier on Saturday afternoon, the 14th. If so, this will be perfectly satisfactory. I have based the above reservations on an estimate of about 30 people, including alumni, wives and no doubt a few guests. If the above number of people take part in the program, I would estimate that about three-quarters of them will require dormitory accommodations." Further plans and information will appear in the class notes during the coming year. . . . In a July number of the *Winchester Star* an article, carrying **Henry Spencer's** picture, appears as follows: "The Blanchard Machine Company lost Henry Spencer's services when he retired on June 30. Mr. Spencer joined the company in 1909 as a design engineer after graduation from M.I.T. He worked directly for the company's founder, Winslow Blanchard, becoming general manager upon Mr. Blanchard's death in 1923. Mr. Spencer is credited with the design of the Blanchard grinder in 1911, an industry breakthrough which permitted the company to expand from a small machine shop. Since 1965 Mr. Spencer has served in a managerial capacity and as an engineering and administrative consultant to the company." The article also states that Henry has been a member of the Associated Industries of Massachusetts, National Machines Tool Builder's Association, M.I.T. Alumni Association, Cambridge Chamber of Commerce, and Society of Automotive Engineers. Henry continues to be as active as ever in class affairs, now being our Class Agent and Estate Secretary. It may be recalled that not long ago Henry and Madge celebrated their Golden Wedding Anniversary at the Winchester Country Club with a large number of friends attending. The Class wishes them both many happy years in Henry's retirement.

In the early summer we received a note from Mrs. **Lester Hazen King** telling of the death of her husband Lester on April 21 at Rowayton, Conn., at the

age of 81, after a stroke and 10 days' illness. She stated: "We had been looking forward to the 60th reunion for we both enjoyed the 50th and 55th." She enclosed an obituary clipping from the Stamford paper. Lester was born in Hartford in 1887 and prepared for the Institute at the Hartford High School. At the Institute he was a member of the Architectural Society and of the editorial staff of *The Tech*. In addition to receiving his bachelor's degree in 1909, he received the M.A. degree in architecture the following year. For 50 years he was a most successful architect in New York City, being associated with the building of the Boys' Club of New York, the Metropolitan Life Insurance Company building, the New York City Post Office, and was supervising architect for the Cloister Museum and the Riverside Church. He retired in 1960 and devoted himself to Resources Unlimited in Stamford. He was a member and active in the Noroton Presbyterian Church, a member of the American Institute of Architects, the Noroton Yacht Club, and Darien Historical Society. Besides his wife he is survived by a daughter, Mrs. Donald J. Stroop and two granddaughters. We have written to Mrs. King conveying to her the sympathy of the Class. . . . We received a notice of the death of **George Weinhagen, Jr.**, at Rancho Santa Fe, Calif., on May 16. He was born July 19, 1885, in Milwaukee, and prepared for the Institute at Milwaukee Academy. At the Institute he was a member of the Mechanical Engineering Society. Our records show that he worked in the A. G. Schultz Box Factory in Milwaukee most of his life and moved to California in 1956. . . . We have also received from the Alumni Office a notice of the death of **William T. Mahoney** which occurred at North Chattanooga, Tenn., on December 7, 1967. Our records show that he attended the Institute only in his freshman and junior years and that he lived most of his life in North Chattanooga. —**Chester L. Dawes**, Secretary, Pierce Hall, Harvard University, Cambridge, Mass. 02138; **George E. Wallis**, Assistant Secretary, 185 Main Street, Wenham, Mass. 01984

10

Frank L. Cobb passed away on April 18, 1968. Mrs. **Carroll A. Sutherland** notified us of the death of her husband on June 19, 1968. . . . **Hal Manson** writes: "We have sold our home in Brookline and have been very busy in disposing of the contents and could not get away for Class Day. We will be established at 1636 32nd St. N.W., Washington, D.C., 20007. The small house we own there is much better adapted to our requirements and we will be very content there." . . . I had lunch with **Walt Spaulding** earlier this month. He did not have time to make a longer visit. . . . At the Alumni Day there were: **Ralph Horne** and wife; **Murray Mellich** and wife; **Bob Burnett** and wife; **Arthur**

Curtis; Charles Wallour and wife; and **H. S. Cleverdon** and wife.—**Herbert S. Cleverdon**, Secretary, 120 Tremont Street, Boston, Mass.

11

Before World War I, Dennie started holding meetings of the Class as near as he could to the 11th day of the 11th month. These were always enjoyed by those who attended and have been carried on annually through last November. However, at the last two only five members showed up and we questioned whether it would be worth while to hold another. Early in July I sent a reply card to the 29 classmates who live within about 50 miles of Boston. Only four replies favored continuing the meetings and one of these has not attended in recent years. So I have decided this old established custom has to come to an end. There will be no get together this November. . . . The Class is slipping. Only three, **O. W. Stewart**, **Morris Omansky** and I showed up for Alumni Day last June, the poorest showing of any class in this century. . . . On the other hand **O. W. Stewart**, Class Agent for the Alumni Fund, told me that as of June 1, with one month of the 1967-1968 year to go, 63 per cent of the active members of the class had contributed to the Fund, the highest for any class except 1899.

The following are some of the comments that came along with contributions to the Fund. From **Richard M. Gould**: "As for myself I am still reasonably active in my profession, principally as it relates to Water Pollution Control—some times known as sewage treatment. Fortunately my work is confined to the most interesting phases of problems, leaving the hard work to my associates. While some weight has been added, I still amble around tennis courts with a few indulgent older friends. This week I take off for the land of the black flies and land locked salmon." From **Norman Duffett**: "Just enjoying retirement, with winter at Lake Worth, Fla. and summer in Niagara Falls." From **Armand Peycke**: "Just recovering from payments of over \$12,000.00 medical for my sweet wife in 1967. Now well recovered." . . . The following items came to me on the reply cards about the November Class meeting. From **Edward Sisson**: "I am away all the winter months. When I am home I go in to business, American Architectural Iron Company, every day. I play golf twice a week. We have eight grandchildren and enjoy visiting around. We have been abroad five times, points east and west." From **William Coburn**: "Still in business at 68 Devonshire Street. We have just completed building a new summer home in South Westport near Horseneck Beach. It sits on 10 to 12 acres of ridge with a magnificent view of Westport River and the ocean." From **Maurice Lowenberg**: "Had somewhat of a tough time of it for the past eight months, medically speaking,

for both Sarah and myself. Hope soon to be full of vim and vigor." From **Roy MacPherson**: "Last time was day of my only brother's funeral. Whenever two or three are gathered together in memory of Dennie, I think it is worth while." From **Suren Stevens**: "May I suggest that the '11 meeting be discontinued this year and make it every other year." From **Morris Omansky**: "I am active professionally on a part time basis. All are well." From **Marshall Comstock**: "Helen and I are doing very well, considering, and are able to enjoy life. We are apt to be in Maine in early November, also we don't drive at night any more. It seems as though you should have a larger attendance." From **L. G. Fitzherbert**: "Having a quiet summer at home with short trips to Maine and New Hampshire. Hope to make the Cape this fall. Never go to Boston." From **Willis Hodgman**: "I do not favor continuing the meetings for the reason I never seem to get there. In theory the idea is a good one." . . . As usual a memorial service was held in the chapel at M.I.T. on the morning of Alumni Day, for those whose deaths had been reported to the Alumni Association between June 1, 1967 and June 1, 1968. The following were from our Class: **Harry S. Alexander**, **Ernest J. Batty**, **Fred H. Daniels**, **Henry C. Frisbie**, **Herbert Fryer**, **Edgar C. Savage**, **Charles R. Strong**, **Laurence Watts** and **Philip V. Wells**. . . . I want to correct a couple of errors in the biography of Frank Smith that appeared in these notes last spring. It was Howes' not Gorre's book on metallurgy that Frank studied; he graduated from Torrington High School in 1903 and retired Dec. 31, 1955. . . . My wife, Alma, suffered a cerebral hemorrhage in mid-July and as this is written (early August) she is recovering slowly in the South Shore Hospital—**Oberlin S. Clark**, Secretary, 50 Leonard Road, North Weymouth, Mass. 02191

12

Do you remember the lunch room in the old Union where we could buy a bowl of rice and milk for ten cents. Frequently this was my entire meal when finances were low. And the student waiters always wore aprons!

Here we are starting off a new year after a vacation in New England. In August we attended the National Covered Bridge Festival for a week in Rutland and went over to Woodstock to see the raising of a new covered bridge, the first structure of its kind built in this state for some 80 years. We hope that each one of you also had a chance to get away for a change of scenery this summer, and that you will write and tell us about it. Class news is becoming more and more difficult to obtain. . . . Due to illness in the family we were unable to attend the gathering of the clan in Cambridge on Alumni Day, but **Jim Cook** forwarded autographs of those present. There were 13 classmates

and wives in attendance, including **Jim Cook**, **Al Davis**, **Johnny** and **Caroline Noyes**, **Bob Wiseman**, **Wallace Murray**, **Jerry Hunsaker**, **Bill Collins**, **Fred Busby**, **Walter** and **Bertha Lang** and **Cy** and **Marjorie Springall**. On account of rain the luncheon was served in Rockwell Cage, but the weather did not dampen the enthusiasm of those who attended. The luncheon and talks were well handled.

We have received notices of the following address changes: **Hugo H. Hanson**, Apt. BS49, 6909 Ninth Street S., St. Petersburg, Fla. 33705; **Julius M. Rosenberg**, Apt. 14H, 5255 Collins Avenue, Miami, Fla. 33140; **Paul M. Tyler**, 617 Dundee Lane, Holmes Beach, Fla. 33509; **Wallace J. Murray**, 11 Laurel Lane, Dedham, Mass. 02026; **Ora M. Merry**, 2125 E. River Terrace, Minneapolis, Minn. 55414; and **Miss Hattie D. F. Haub**, 50 Harrison Avenue, Sausalito, Cal. 94965.

We also sadly announce the passing of three classmates: **Raymond C. Foster**, Sunday River Road, Bethel, Maine, last January; **Michael W. Murray**, 3 Tropical Drive, Ormond Beach, Fla., in June, 1967; and **Sidney L. Day**, 710 Jefferson Avenue, Huntington, W. Va., last February. We received a letter from Sid's daughter, Kathryn, which explained that he retired about five years ago due to failing health. On graduation Sid spent one year with a Cincinnati architect following which he joined his father as an architect in Huntington. He became well known in this vicinity, and numerous churches and residences, a few schools and several office buildings are living memorials to his ability. He was a veteran of World War I, a member of the American Association of Architects and active in the local Presbyterian Church. He is survived by his widow, two daughters and three grandchildren. . . . On the brighter side we take pleasure in reporting the marriage of **Cy Springall**'s son, Tom, to Roberta Gunn which took place in Memphis last May at the Naval Air Station chapel. . . . We have a note from **J. V. MacDonough** sending greetings to all of the gang. Mac says he is in fairly good health and is living alone at the old homestead in Watertown. He lost his wife in 1948. He has three children, two of whom are married, and six grandchildren. He retired five years ago. **Oliver Holmes** reports that he spent a winter vacation in Florida. Following graduation he and Charles Whitmore, his roommate, went to work for General Electric, Oliver at the Schenectady plant. As a State of Mainer, however, he could not resist his father's request to help him run his large sardine business in Eastport, so he soon left G.E. and spent the rest of his career running and developing this rapidly growing business in his home town. He married in 1913 and has two sons and two daughters. There are nine grandchildren and two great-grandchildren. His older son runs a tanker for the N. J. Standard Oil Company

and the younger son teaches at Portland High School. Oliver reports that he is in good general health and is presently living with a daughter in Wyndmoor, Pa. He has a cottage at Lake Pennamquan near Charlotte, Maine where he spends the summers.

Ken Barnard sent me an interesting letter from Cape Cod where he now lives. It seems that he was a neighbor of Professor Talbot in West Newton at which time Ken had entered Harvard to study chemistry for a medical career. Dr. Talbot induced him to change to Tech with the practical guarantee of a good job on graduation whereas, if he went on to medical school, it would be five years longer before he would be able to marry and support a wife. "You recall in those days one had to have a proper income to marry. So I made the shift and it all worked out as he had predicted." Ken started with the N. J. Zinc Company in Palmerton, Pa., and after three years transferred to the American Zinc Company, Hillsboro, Ill., as a metallurgist for a pilot plant, and soon became superintendent of their zinc oxide plant. Both he and his wife wanted to get back to their native New England, however, and he secured a job as textile chemist with the Pacific Mills. He became divisional superintendent and then advanced to Research Director of their new laboratory in Newark, so his stay in New England was brief. Suddenly the management decided to abandon the research project and Ken secured a position with American Cyanamid, Bound Brook, N. J., where research is a vital part of their activities. Here he remained until retirement in 1954, directing the research activities of this complex chemical organization. Ken writes: "Next to my choice of a life partner, probably the best decision I ever made was to purchase the old homestead in Barnstable for a retirement location. We had summered there most of our lives and knew most of the townsfolk, many of whom were her relatives and old time friends. We are active in the Unitarian Church, and members of various civic and community organizations. I have also served as Chairman of the Town Personnel Board and Historic Committee. Sailing is my hobby and when the weather is too bad to sail or swim you can usually find me in my carpentry shop. We have travelled a good bit throughout the country by car, visiting all but four of the 48 states, including two trips to Florida and two to New Orleans and the Gulf Coast. We particularly enjoyed the National Parks and the Rockies with their wonderful scenery and interesting people. But somehow Cape Cod always seems the best to me. In 1959, the local Colonial Candle Company learned that I was a retired chemist and built me a laboratory where I still do some consulting work, part time, in solving as best I can their many chemical problems, a job which keeps me busy and happy. We have three children, seven grandchildren and six great-grandchildren all of whom, I think, we

have convinced that Barnstable is just this side of Heaven, since they come down to see us whenever they can. So with peace of mind and good health, what more can a 1912 graduate ask for?"

Wallace Murray has an interesting story to tell of his activities. "At graduation I accepted a position as assistant to Professor Moore in the Organic Chemistry Laboratory. He had promised to get me a fellowship to study for my doctor's degree in Germany if I first returned to teach at Tech. The following year I was an instructor in analytical chemistry and also taught in the summer schools of 1913 and 1914. **Charlie Reiman** had also made a similar arrangement and during the next two years we worked together most of the time. In August, 1914, we were ready to sail for Germany when World War I broke out, and on the advice of Professor A. A. Noyes we sailed for Liverpool instead, not knowing what we would do on arrival. We visited a number of British universities to see about studying in England as the war prevented our going elsewhere. We met Professor J. B. Cohen, whose books I had used at Tech, and he arranged for us to study at the University of Leeds where we spent two profitable semesters. However, because of the conditions of our fellowships, we wanted to attend a German-language university and finally secured admission to the University of Zurich in Switzerland. Alfred Werner, one of the greatest chemists of his time, was at Zurich and we hoped to study under him. However, our interview with him was most unpleasant, as he was very pro-German and made it evident he did not like Americans. We decided that we had better go elsewhere as he suggested, but war conditions limited us to the Swiss universities. We finally registered at the University of Geneva at the invitation of Prof. P. A. Guye and remained until August, 1916, receiving our doctor of science degrees. We did have a bit of trouble learning to speak French instead of German but this was not too difficult. Our stay in Geneva was delightful and our professors friendly. During vacations we enjoyed mountain climbing and sight seeing, which was, of course, limited to Switzerland. In September 1916 I became an instructor at Northwestern University and then went to the National Aniline Company as research chemist. I joined the Chemical Warfare Service in 1918 as First Lieutenant, working on toxic war gases. After the armistice I took a job with a small dye company, but in April, 1920, joined the staff of Arthur D. Little, Inc., in Cambridge, where I have since remained. My work has taken me from Newfoundland to California with assignments in laboratories, industrial plants, courtrooms and libraries, involving many fields of chemistry, although I am primarily a synthetic organic chemist. I continue to work as a consultant on a part time basis. I married Ina Shordon of Fort Wayne, Ind., in June, 1920. I have one son and one daughter. My

son (M.I.T. 1942) is editor-in-chief of the D. C. Heath division of Raytheon. After "retirement" in 1955 we were able to do considerable traveling, including a world cruise, the Mediterranean, South Pacific, South America, Europe (two trips), and others. In August, 1966, my wife died and I have just moved to live with my son in Dedham, which is much pleasanter than living alone." A very interesting career. Wally!

Jay and **Priscilla Pratt** spent nearly a week last July as guests of **Willis Salisbury** at his delightful summer camp on Hungry Jack Lake near Grand Marais, Minn., which is on the northern shore of Lake Superior. Here they roamed the North Woods in the old Voyageur country, and delighted in the wonderful Salisbury hospitality, including some of Willis' specially prepared meals; he is an excellent cook. Jay writes that it has been nearly three months since he last received any class news, and contributions to your secretary have been most meagre. After the remarkable record set by our class last year, at least one page per issue, I feel certain you will not let us down. How about it?—**Ray E. Wilson**, 304 Park Avenue, Swarthmore, Pa. 19081; **Jay H. Pratt**, 327 Fair Oaks Avenue, Oak Park, Ill. 60302

13

M.I.T. staged the usual successful Reunion, our 55th. We were disappointed that the attendance was so low, but those of us who were present all enjoyed ourselves. The following really reuned: The **Ellis Brewsters**; the **Allen Brewers** from Florida; the **Lawrence Browns** of Massachusetts; the **G. P. Capens** of Massachusetts; **William Newsome Eichorn** and his guest, Wilbur, of Massachusetts; **John Farwell** of Connecticut; the **Warren Glancys** of Massachusetts; the **Henry Gliddens** of Massachusetts; the **Frederick Kennedys** from California; **Burton Cushing**; the **Hilding Carlsons**; **Eugene MacDonald**; The **Bion Pierces** of Massachusetts. (We welcome the newly weds, Bion and "Bunny"); the **Geoffrey Rollasons** of Connecticut; **R. Charles Thompson** of Massachusetts; and **Charles E. Trull** of Rhode Island. Mrs. Hilda Coppage and her entire organization were extremely co-operative and friendly. The Village is most well appointed and attractive. The food was out of this world.

The Class Meeting was very well attended; the President and the Secretary and Treasurer gave their reports of the class activities for the past five-year period and of plans for the 60th Reunion in 1972. A letter of resignation was read from Vice President **William R. Mattson**. By a unanimous vote of those present, the resignation was not accepted. It was unanimously voted that the following officers should continue for the next five years: President, **R. Charles Thompson**; Vice President, **William R. Mattson**; Secretary and

Treasurer, **George Philip Capen**; Class Agent, **Ellis W. Brewster**. Ellis Brewster asked for assistance and any new suggestions to increase the number and gifts of donors from the Class of 1913 to the Alumni Fund. The Happy Hour was greatly enjoyed by our classmates and their guests. Again, the personnel of the Coonamessett Inn were very co-operative and lavish. The Class Banquet was an event that we all shall remember. It was highlighted by a message of "Heartiest Greetings and Best Wishes to Each and All of the Class of 1913" from **Arry** and **Larry Hart**. Greetings and a toast were read from "Jo" and **Bill Mattson**. A message was received from **Azel W. Mack**, Secretary of the Class of 1915, to the "fine old Class of 1913" extending friendly sincere wishes for a "Big, Successful and Happy 55th." Again, we must praise **Hilda** for the wonderful and bountiful clambake at Poppononesset Beach. The Capens wish to thank all attending the Reunion for their expression of appreciation. It is always a pleasure to serve our classmates.

A typical group of '13ers enjoyed the Alumni Day Luncheon: **Charlotte Sage**; **Eugene Macdonald**; **Raymond Haynes**; **Walter Muther** and his charming daughter, **Mrs. Larson**; **Warren Glancy**; **Philip Terry**; also the **Philip Capens**. The Happy Hour and the Alumni Day Dinner were the usual enjoyable events which provide good entertainment and opportunities for the members of all classes to meet, renew old friendships and make new acquaintances. Again, we must congratulate **Donald P. Severance**, '38, and his associates, for forwarding a copy of the program of the memorial service together with a letter to all next of kin, for all M.I.T. Alumni reported deceased during the past year. . . We have received a note of appreciation from **Arry** and **Larry Hart** in which they wished us to thank all members present at our Class Banquet who signed a good luck card and forwarded it to the Harts. . . We regret to report the death of **Charles Parker Fiske** of the Class of 1914 who was a very close friend to many of us in the Class of 1913. We are indebted to **Ellis Brewster** and the Alumni Office for the sad news of the death of **B. Donald Horgan**, 1005 Jackson Street, Denver, Colo. He passed away February 4, 1968. Horgan was a graduate of the Class of 1913. . . Again, it is with a heavy heart that we report the death of **Halsey B. Horner** in Wellesley, Mass., August 15, 1968. He was buried Monday, August 19, 1968. The Class of 1913 was represented by **R. Charles Thompson** and **Stuart J. Eynon**. The survivors are: His wife, **Edith**, his two sons, **William R.** of Newtonville and **Charles E.** of East Longmeadow; **Mrs. Jane H. Politzer** of Berkeley, Calif; and eight grandchildren. "Jack" graduated in 1913 from Course LV, architecture. He was always very active in school activities such as M.I.T. Athletic Association, Musical Clubs; 1913 Football Team, Basketball Manager, and *Technique* Electoral Committee. He was

one of our loyal '13 alumni. . . Further notes of the 55th Reunion in the next issue.—**George Philip Capen**, Secretary and Treasurer, 60 Everett Street, Canton, Mass. 02021

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Charles Parker Fiske died at his home in Bath, Maine, on August 9, 1968. Charlie's activities as a member of 1914 are so well known as to need no elaboration both as an undergraduate, and after graduation, when he served as class president for so many years. In his professional life he spent a brief time in the Ordinance Department in Washington but rapidly moved into the General Motors organization, first in Boston and later on to General Motors Acceptance Corporation where he became Vice President. When he died he had homes in Bath, Maine, and in Florida. His classmates will ever remember him for his vigorous leadership and "head clear as a bell." The following is a quote from the New York *Times* of August 9, 1968: "Bath, Me. Aug. 9—Charles P. Fiske, executive vice president of the General Motors Acceptance Corporation from 1954 to 1957, died in a hospital here today after a brief illness. He was 76 years old. . . Mr. Fiske had spent his summers since 1946 at nearby Phippsburg and had lived in Belleair, Fla., during the winter. . . He was born in Lynn, Mass., and attended Massachusetts Institute of Technology, from which he was graduated in 1914. Mr. Fiske joined the General Motors Acceptance Corporation in 1920. . . He was a member of the University and Union League Clubs of New York. . . Mr. Fiske's first wife Marie Elizabeth Blood, whom he married in 1916 died in 1964. He married Gladys D. Clarke of Belleair in 1965. . . Also surviving are a son, **George M.** of New York; two daughters, **Mrs. Grace F. Gillett** of New Canaan, Conn., and **Mrs. Anne F. Thompson** of Bloomington, Ind.; seven grandchildren and a great-grandson."

As a matter of class records the Alumni Office notes that mail recently addressed to **Joaquin Masferrer**, No. 513 Nuevo Vedado, Havana, Cuba, was returned noting that Masferrer had died December 24, 1953. Thus are our professional ties eroded by international chaos. . . Alumni Day, June 9, 1968, was attended by a somewhat smaller 1914 contingent than usual. The **Harold Richmonds** were on a round the world trip. Yours truly was temporarily indisposed. However, we have complete reports from **Dinny** and **Ham** who were there with their wives. **Ray Dinsmore** was there, also **Elmer Dawson** and his wife, **Freeland Leslie** and his wife, **Tom Callahan** and his daughter. **Russ Trufant** was registered but was not seen.

Les Hamilton's long continued association with the Institute also gives him access to Alumni Day festivities such as a cocktail and dinner party of the Class

of 1928 as well as a similar affair of the Class of 1943 to say nothing of graduation, the dedication of the Julia Fassett garden and activities of the crew Alumni. . . And now a dramatic note from **Alden Waitt** (dated July 22, 1968). "Dear Herman: At last I have something of consequence to report, something worthy of inclusion in the 1914 class notes. I am a great grandfather! My oldest granddaughter Kathy combined graduation from Colorado College with presenting to the world this new great grandson of mine, **Noel Seeburg**. How about that? . . . And it looks as if Kathryn and I shall get away to Europe on August 4 when we have reservations confirmed to Frankfurt, Germany. We hope to spend about two months overseas—part of the time visiting our daughter and her family in Heidelberg and our son and his family in Illesheim (a little town not bit enough to be on the map but headquarters of the 1st Brigade 4th armored division). . . It would have been nice to have been able to have had a few weeks in New England before going overseas but no chance this year. Maybe next year after the New York fairs and so much more comfortable and convenient Expo here that it outclasses them completely. Better fly down here and see it. . . Hope you are having a pleasant summer and that all goes well. Best wishes. Alden."

We still have a few interesting reports of the doings of our classmates who have not been heard from for some time. **Walter C. Eberhard** says: "I still am trying to keep active by supervising the College Board Exams at M.I.T. (which I have done for many years) and a certain amount of drafting and illustration work plus teaching at Franklin Institute on nearly a full time schedule." In other words, hardly anything,—which should shame most of us. . . **C. Sheppard Lee** notes: "Have just been gutted by fire—loss . . . life of housekeeper." **Homer Calver** writes that for the early part of 1968, he was visiting lecturer and consultant, School of Public Health, University of Hawaii, Honolulu. He is now back at his consulting practice in N.Y. . . **Lin Faunce** tells us that he is now Program Chairman of the Historical Society of his home town of Bloomfield, Conn.—**Herman A. Affel**, Secretary. Rome, Maine. Post Office RFD 2, Oakland, Maine 04963

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Hello everybody! Here beginneth the first column of the new season with the hope you and your families have all enjoyed a pleasant and happy summer. We sent congratulatory messages to the fine 1913 and 1918 Classes for their Fifty-fifth and Sixtieth Reunions, respectively. We sincerely sympathize with 1918 in the sad loss of their loyal, hard working Secretary, **F. Alexander Magoun**, who died in Jaffrey, N. H., shortly after their successful reunion.



Philip L. Alger, '15

Our own Annual Class Cocktail Party and Dinner was bigger than in any non-reunion year. With 54 for cocktails, 40 for dinner and 33 at **Bill Smith's** after dinner it was the biggest, best and noisiest we've ever had. The "younger" members of the Class added a lot and were particularly welcome—Chris Brown and his wife; Herb Eisenberg; **Horatio Lamson's** daughter, Sybil; six from **Harry Murphy's** family; Jerry and Jan Rooney; Bill and Janette Sheils; **Carl Wood's** niece, Carol Stone. The 1943 Class previously had the Rooneys and the Macks as 1915 representatives at their elaborate Twenty-fifth Reunion Cocktail Party. So, Jane and Jim Hoey, '43, with the Bill Lairds, '43, came to ours. Bill Laird is a really startling "look alike" for President Howard Johnson and perpetrated a good-natured hoax on many of us, some of whom still refuse to be disillusioned. Pearl and Albert Wechsler, '21, are always welcome. It's unnecessary to classify **Barbara Thomas** as a guest, for, she is really a part of the Class and by her friendly and personable presence added a great deal to the party's success. New guests who are welcome to return are Roland E. Derby, '49, and Otto Putnam, '33. And we hope **Bill Smith's** sisters, Charlotte and Florence, will come again. Bill Morrison set up a delicious dinner for us at the Faculty Club, led by the Pirate's "We are happy" cheer and spirit. On to Bill Smith's, where despite the miserable rain, the Smith family gave us all a cordial (no pun) and generous evening. Long may the Class Supreme wave!

Some interesting notes from many good classmates. On June 7, **Phil Alger** was awarded an honorary doctor of engineering degree by the University of Colorado at Boulder. "Helen and I flew out to Colorado and on the 7th I donned an orange hood and a mortarboard and was duly awarded the degree of *DE honoris causa* in the Stadium

at Boulder, where over 2,000 students received their bachelor degrees; many received other degrees of many kinds. It was a colorful and painless ceremony—a good deal like an old ship acquiring one more barnacle. It can't be taken off, and it somewhat impedes passage in activities at the lower levels where things are going on. On the way out we stopped in Chicago, where I saw **Verne Kennedy**, who drove me to the airport and gave me much good advice. He is now fully retired, but still has lots of ideas. We hope to go up to Rumney for the summer some time next week, and there we will be looking forward to seeing you ere long. A few weeks ago I was invited to talk to the board of directors of the A.S.Q.C. about their code of ethics, in relation to the present furor over safety of automobiles, and the resulting need for better ways of measuring car performance and appraising the consumer's risk. My talk ought to appear in *Quality Progress* soon. I am to present a paper on saturators at the I.E.E.E. meeting in Chicago, September 30-October 2." This is an honor Phil richly deserves for his outstanding and advanced work in the field of electrical engineering. What steam and stamina he has. For a year or so ago when he was here in the Massachusetts General Hospital, it did not seem as though he'd get back to Schenectady.

On the reply card for the Class Cocktail Party, **Dick Bailey** wrote: "No, I'll knot be with yew. But I did very much enjoy the 1915 New York City Dinner in April. It's always a pleasure to see yew, but yew are too far away now." Signed "Crazy Dick," which may not be too far wrong. **Larry Bailey**—"I ran into **Bill Brackett** recently at the South Duxbury Post Office. He has built himself quite a mansion down here for his retirement. With him and **Ray Delano** we could have a 1915 Duxbury reunion down here." We all hope **Sam Berke** will do as he is told to keep well. He wrote: "Just a word that I am feeling fine; my doctors tell me that I can do anything but eat fast, eat a great deal and aggravate myself, so I shall try and behave on these three items." **Lucius Bigelow**—"I'll be with you in spirit but I can't go so far away." **Art Bond** sends regards, especially to his Course I friends. **Jerry Coldwell**—"I've just read your fine June notes and, as you suggested, read the Class of 1918 notes written, I presume, by Alexander Magoun their Class Secretary. The thought was well expressed. However, it covers a subject about which many of us—you in particular—have speculated for many years. It is a difficult thing to put into words but that sort of spirit certainly does exist and I'm very glad it does. Verta and I leave on Thursday for a few days in a Simmons' dormitory as it is her Fiftieth Reunion. She was President of her class for a year and was on the Simmons Corporation so I believe she makes some kind of a speech at the main banquet that Saturday night. She asked me for a story or two she might use—but definitely turned down a couple I offered!

Best regards to you and Fran. Sorry we couldn't get up for our Reunion, or is it Homecoming nowadays?" Knowing Jerry's repertoire, I can easily understand how Verta would turn down some of his stories. But they were "show stoppers" at our Class Dinners.

John Dalton—"I enjoyed seeing you at the Class Party, keep up the good work. I manage to sneak in a couple of rounds of golf each week and to play some duplicate occasionally." John is really a "big league" bridge player. **Francis Hann**, Beverly Hills, Calif.—"I hope to catch up with you all, sometime." We hope so, too! **Virginia (Thomas) Johnston**, Washington—"We surely wish we could be with you. Our best wishes to all 1915." Nice to hear from her, but we missed her. Mrs. **Clive W. Lacy** was Chairman of the Transportation Committee at her Wellesley 1918 Fiftieth Reunion. After the outstanding job she did at our Fiftieth, in charge of the Ladies Committee, it goes without saying her Wellesley work was very successful. Clive has had a tough summer recovering from two cataract operations. Representatives of the Class have visited him several times to cheer him. **Joe Livermore** couldn't make the party, but sent regards to all. After a winter in Tucson, Virginia and **Hank Marion** toured the Pacific Coast and Southwest, returning to Plainfield, N. J., in early May and Hank wrote, "home looked pretty nice." They were blessed with good weather all the time. It was wonderful to see Hank at our party—looking and feeling so well and in such gay spirits. Truly he has had a remarkable recovery from his really serious surgery and illness of a few years ago. Keep it up, Hank. **Herm Morse**—"Sorry not to be with you all, but I'll make it in 1970." Nice going, Herm, we'll all be glad to see you here. **Cliff Sifton** expresses a similar sentiment: "I am sorry I can't be with you this year. Renewing old ties is a very rewarding experience. I hope to be with you for certain in 1970. All the best to you and the 1915 crowd."

On a card with a pretty and impressive picture of huge redwoods with burls, **Ray Stringfield** wrote: "We are sorry not to make the class party this year, but we are relaxing up in the redwoods about 645 miles north of Los Angeles. I doubt whether I can work any more when I return." What a life! **Bur Swain**, formerly the life of the party—"Oh, how I hate to miss this. Gee! gosh! I'll be lifting one to you all. Have Fun!" About the middle of June, **Jim Tobey** had a cataract operation. I phoned him and he is recovering slowly through the dull period of no reading, writing or drawing. Hurry up and get well, Jim. In my Class archives I found a letter from Jim, then Lieutenant Colonel, dated October 9, 1944, from somewhere in France. Jim wrote: "I have been in France several weeks and have arranged to see something of Paris, the world's most beautiful city, as well as some of the combat areas. Regards to all Fifteneers." How about that? Your devoted, hard working committee of Max and The Pirate have

set up our Fifty-fifth Reunion (just think of it), for June 12-15, 1970, at Coonamessett Inn, Falmouth, (Cape Cod) Mass. Many will remember this as the charming and delightful scene of several of our Reunions. Plan on it!

It's sad to report the loss of these classmates: **Walter M. Africa**, May 15, at Pittsburgh; **Dr. Ralph W. Mendelson**, April 5, at Albuquerque; **Ulrich C. Schless**, May 15, at Miami; and **Nelson Slater**, April 25, at Vevey, Switzerland. Letters of sympathy have been sent to the families of these departed men. **Nelson Slater, Jr.**, '50, wrote:

"Thank you very much for your nice note on the passing of my father. He was indeed very proud of M.I.T., and I feel that he always regretted not staying there and pushing through and graduating. But he gave me the will to do it, and I'm very glad I did. My father would have been very pleased to have such a letter." . . . Write what you can, when you can, for the class column. It will "help Azel."—**Azel W. Mack**, Class Secretary, 100 Memorial Drive, Cambridge, Mass. 02142

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Our 52d Reunion has come and gone, held on June 7, 8 and 9 in that charming location, Chatham Bars Inn in Chatham on Cape Cod, where we have had so many delightful reunions before. This time we had the pleasure of celebrating with our friendly younger classes, the '33ers on their 35th Reunion and the '38ers on their 30th. It was again a sparkling occasion with all '16ers in their 50th cardinal red blazers—we even overheard one of the distaff members of '33 say "I want one of those." The red blazers have become sort of a standard feature of 50-year reunions with the pattern set by 1916, then 1917, and currently 1918. **Jim Evans** is getting more and more inquiries on how to go about ordering these attractive jackets that are receiving "plus" comments at both M.I.T. and non-M.I.T. affairs across the nation (so class secretaries say). There were a total of 37 at our 50th at Chatham including the **Jap Carrs**, **Charlie Cellarius**, the **Harold Dodges**, the **Paul Duffs**, **Jim Evans**, Mrs. H. C. Fisher, the **Ralph Fletchers** and sons Jack and Sam, the **John Gores**, the **Charlie Lawrances**, the **Irv McDaniels**, our honorary member and reunion systematizer **Bob O'Brien**, the **Izzy Richmonds**, the **Henry Shepards**, the **Francis Sterns**, the **Peb Stones**, the **Hy Ullians** and Mr. Silber, the **Don Websters** and the **Vert Youngs**. And weather? Just about perfect for three days—some early morning haze but soon totally clear and plenty of sunburns in the making.

From the greatest distances came **Irv** and **Kay McDaniel** from Newport Beach, Calif., via a visit somewhere in Virginia, and **Vert** and **Sylvia Young** from Bogalusa, La. Whether it's a story or not, who can be sure, but—Irv and Kay

arrived on Friday, Irv was positive it was Thursday and tried hard and openly to uncover the mystery of the lost day! Then too, **Peb** and **Dolly Stone** discovered on arrival Friday, that he had left his jacket (suit jacket, not the red one) in a restaurant in New London on the way up to the Cape from Jackson Heights, N.Y. And one more "minus" item—it was widely regretted that **Joe** and **Mary Barker** never made it because of a transmission breakdown of their Hillman en route Friday, and then a repair job that didn't last and that forced them to return home to New Rochelle in second gear.

As usual, Cottage G was the headquarters and general meeting place for '16ers. Here a highlight was **Irv McDaniel's** demonstration of a new 1916 tape that he and Kay had prepared over the past year. Three copies of the tape were presented to President **Ralph Fletcher**, to Vice President **Joe Barker** (by proclamation in Joe's absence) and to your Secretary. These tapes bring back memories of the old Tech Show days, songs of over 50 years ago, lyrics and tunes created by Irv and other '16ers that are still memorable, the Class March down Boylston Street and the Alumni Day antics, stunts and demonstrations (peaceful) at Nantasket Beach on June 13, 1916. Cottage G also had its customary bulletin board with photographs, newspaper clippings and high level news items in the lives of '16ers over the past 12 months since the last Reunion. And Cottage G rang with stories galore that collectively would make an album of the rarest and best. One of our reporters tells of the "late arrival of gin and the discovery that vodka martinis are just as good"—is "discovery" the word?

Activity-wise, not much really exciting happened at the 52d but it surely was comfortable! The tennis courts were busy with **Jap Carr**, **Izzy Richmond** and **Bob O'Brien** looking quite sharp along with the younger players. The much younger generation, represented on the courts by Sam and Jack Fletcher, was a credit to 1916. The nine-hole golf course was tried out by several including your two Secretaries with **Francis Stern** as scorekeeper. Both players cleared the pond on the first water-hole. This, together with the fact that it is quite a climb to the driving area, raised the question whether it was necessary to shoot over water in later rounds. Something much more professional appeared in the golf scores of Anne Richmond and Bob O'Brien. As for bridge, your Assistant Secretary reports lack of a scheduled game, that "the Sterns were ready but golf and naps interfered." As for swimming, only the Fletcher boys tried that! . . . The class banquet on Saturday evening was the usual bright success with excellent food topped off with Ralph's supply of a choice dinner wine. There were a number of innovations, if that is the word. It doesn't pay to make an ordered sequence of innovations, e.g.,

Innovation No. 1, Innovation No. 2, etc., but we do have to mention **John Gore** and his bird calls. Ralph started off the after-dinner talking with what someone reports as a list of "rara avis," beginning with the "double-something seersucker" and becoming more and more exotic. Sorry we don't have the list. Then came John Gore with his bird-and-other calls—all approved as they came so authoritatively from a long-term director of Boy Scout activities. Perhaps the most intriguing calls were the ones covering two dogs, one near and one far off, and a second one representing the country sound of sawing wood. In between speakers and toasts, **Jim Evans** supplied musical jingles about classmates, all to the tune of Heigho the Dairy-O. And **Paul Duff**, a life-long physician and surgeon of Peabody, gave in to requests for an accounting of things that happen to a doctor. He told of many things—about Frances' missing birth certificate when they were to get married, his treatment of needy cases in tenement districts, how his father, also a doctor, left Paul in charge on one occasion of a few days, and also left six signed death-certificates "hoping that that would be enough until" he got back.

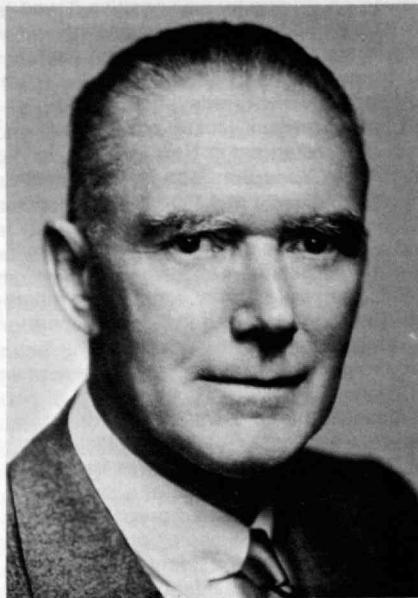
A number of items come back to us about the reunion: the gorgeous gowns of Marie Fisher, Kay McDaniel and Sylvia Young; **Vert Young's** knowledgeable comments on current events and his unconscious resemblance of the proverbial Kentucky Colonel, in several respects; dancing with danceable spritely contemporaries to the piano-accordion music in the cocktail room; the enthusiastic John Regan, '33, and his borrowed '16 red jacket used as an unnecessary excuse for dancing with our nimblest and best; Paul Wing, '33, playing his German whistle with **Irv McDaniel** at the piano; Irv's rendition of Tech Show music of that bygone era of 50 years ago; **Jap Carr** in his red jacket and shorts on all occasions; the Bulgarian medal worn by Irv McDaniel and the colorful reason it was awarded; the Class of 1933's kind invitation and President Ralph's responding message of good will to the assembled youngsters who have been out of school only 35 years (we hope they'll be back next year); also, 1933's friendly invitation to enjoy their magician and his name-and-face recalling act; the report of Mesdames Lawrance, Stern, Stone and Dodge on the operations on the Chatham Fish Pier, on the handling of large codfish and the small boats used to reset lobster pots and identifying colored floats; the Theron Curtises, '39, and Theron's refreshing views on what is needed in Washington; the **Henry Shepards** who came in a regular automobile, not in one of Henry's old classics like his 1913 Chalmers Pony Tonneau; the **Hy Ullians**, with more interesting information on aerial surveying and higher education in Massachusetts; **Izzy Richmond**, with his plane and his surprising but solid reasons why a single-engine plane is safer than a

two-engine plane (in leaden skies, Anne drove Izzy home in her car, but he returned with another pilot later by air, in clearing skies, to fly his own plane back); the newspaper spread brought by the **Charlie Lawrances** showing some of the remarkably new architecture in buildings being designed by Izzy Richmond and his company; **Don** and **Nell Webster**, right from their new home in Falmouth, and looking as though the Cape is a good place to live; **Charlie Cellarius** and his camera everywhere getting some of the best pictures of people at the Reunion; The **Charlie Lawrances**, and the beautiful M.I.T. 1916 dedication book of sketches and the souvenir program given by Charlie to your Secretary; **Bob O'Brien**, and his remarkable care of us-all at another of our bubbling Reunions; the wonderful work of the hotel and the maître d'hôtel in providing us with truly outstanding seashore meals at all times; and last, but by no means least, the really superior clambake on the shore in bright sunshine, clear air and waves lapping the shore, with clams and lobsters and everything of the very tops in famous New England quality.

So there's the story of the 52d Reunion—don't miss the next one! Vacation schedules have prevented us from sending out our news-gathering letters in time for this issue. But watch the next issue for news. And keep in mind our oft-repeated words: to keep the column full and interesting, write a little but write often to your ever-interested Secretaries. Let us know where you are, wherever you are and what you are doing, whatever you're doing.—**Harold F. Dodge**, Secretary, 96 Briarcliff Road, Mountain Lakes, N.J. 07046; **Leonard Stone**, Assistant Secretary, 34-16 85th Street, Jackson Heights, N.Y. 11372

Note: Mention of the following news release was omitted (no doubt intentionally) from the notes submitted by your Secretary. It is contributed by other members of the Class to remind our readers that our Secretary is quite a guy, even though he won't admit it.

Harold F. Dodge, Professor of applied and mathematical statistics, Statistics Center, Graduate School, Rutgers, the State University (New Jersey), received a certificate of election to Honorary Membership in the American Society for Testing and Materials on October 1, 1968, at the President's Luncheon held during the A.S.T.M. Fall Meeting in Atlanta, Ga., September 29-October 4. He received the award, "in recognition of his pioneering and eminent contributions in the fields of quality control and statistical methods, particularly in sampling inspection; and for stimulating leadership and devoted service to the Society in technical affairs." . . . Professor Dodge received his S.B. degree in electrical engineering (M.I.T.) and his A.M. degree in math and physics from Columbia University in 1922. . . . He



Harold F. Dodge, '16

began his career as an instructor in electrical engineering at M.I.T. and in 1917 joined the Western Electric Company as a development engineer in the Engineering Department that later became the Bell Telephone Laboratories. He was a quality results engineer at Bell Laboratories from 1925 until he retired from there in 1958. . . . While at Bell he was a member of the Quality Assurance Department that pioneered the development of statistical quality control. . . . His work brought recognition as an originator and authority of sampling inspection, quality control and quality rating techniques; his published material and lectures throughout the country form the basis of many industrial practices in these areas.

Professor Dodge assumed his present position at Rutgers in 1958 where he teaches a graduate course in acceptance sampling and directs a program of research in acceptance sampling by students for their Ph.D. thesis work. He is also the co-author of the Rutgers plan of sampling maintenance of electric meters which was adopted by the State of New Jersey. . . . A member of A.S.T.M. since 1932, Professor Dodge has been an active member of the Society's Technical Committee on Statistical Methods since 1946. He was chairman from 1946-1958 and was made an Honorary Member of the Committee in 1966. He received the A.S.T.M. Award of Merit in 1950 and he presented the Society's Edgar Marburg Lecture in 1954, entitled "Interpretation of Engineering Data—Some Observations." . . . Professor Dodge is a Fellow of the American Statistical Association and a Fellow of the Institute of Mathematical Statistics. He is a Charter Member, a Fellow, and an Honorary Member of the American Society for Quality Control and was the 1949 recipient of the Society's Shewhart Medal for out-

standing leadership in the field of modern quality control.

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Alumni Day this year was certainly a different one from last year when we were the center of attraction, about 200 strong with our wives. Those attending this year were: **Ray Brooks**, the **Nelson Chases**, **Dennens**, **Dunnings**, **Jim Flaherty**, the **Elmer Joslins**, **Stanley Lanes**, **Al Lunn**, Mrs. **Dean Parker**, the **Ray Stevens**, and **Tubby Strout**. Our cardinal blazers were worn by all the men.

At the luncheon special recognition was given to the men who had chaired the numerous committees of the tremendous Long Range Planning Committee project of the Alumni Association. **Al Lunn** as General Chairman and **Ray Stevens** as Chairman of the Sub-committee on Communications received souvenir Special Service Awards of a bronze Institute seal embedded in plastic with suitable inscriptions. . . . **Nelson Chase** had finished his 9x7½ foot painting of the Rogers Building and it had been hung in the reception room of President Howard Johnson. The reception room serves both the President's Office and that of the Chairman of the Corporation, **Jim Killian**, '26, and is on the second floor of the central building overlooking the Great Court. Unveiling was scheduled immediately after lunch. Mrs. **Dean Parker** had come especially from Detroit to make the presentation and unveiling on behalf of the more than 20 widows who had so generously made the memorial possible. Her well chosen remarks were responded to by our honorary member, Howard Johnson, as he accepted the painting for M.I.T. Nelson knew Rogers well for he taught in the Department of Architecture for 11 years. He told of some of the interesting details of the building and the painting such as including in the border, features of the old murals in Huntington Hall. Also he presented a block of red sandstone from one of the Rogers columns which he had rescued on demolition.

An attractive two-page folder relating the early development of M.I.T. and the construction of Rogers was prepared by our **Leon Keach**. A supply of this folder is kept with the painting for those who are interested. You are urged to view the painting on your first opportunity. . . . The gift idea, the development of the memorial feature and the selection of the subject, the Rogers Building, reflects credit on all who have been involved. Nelson Chase's rendition is the work of an able artist and a contribution that will be shared by generations to come. Our sincere thanks go out to all who have taken part and especially to the loyal widows of the Class. Plans are under way to reproduce the painting in the *Review*, hopefully in this issue.

Under a June date **Al Lunn** received a letter from the President of the American

Alumni Council a nation-wide organization which said in part: "It is my pleasure to inform you that the Alumni Association of the Massachusetts Institute of Technology has been selected to receive The Ernest T. Stewart Alumni Service Award for 1968. This is the highest accolade the American Alumni Council can bestow. The Award is given this year for the efforts of the Association's Long Range Planning Committee. The Award will be presented at our National Conference in Miami Beach on July 15, 1968." . . . Much has been said and written of the vast job accomplished by AI and his committees. This citation is a well-deserved one and indicates the recognized importance of the study. No doubt the citation will be quoted elsewhere in this *Review* so we will not repeat it. Well done, AI and Ray. . . . It is a bit late to plug our 51st Reunion for, as this is written in July, you may be reading it at Reunion time but we hope you will be there. The announcement of our 51st Reunion at Sturbridge, Mass., on October 9 and 10 included an appeal for funds to replenish our Class treasury. If you have not responded, this is a reminder that your check for your "dues" will be appreciated. Our 50th Reunion was run without any appeal for funds and we ended in the "black" (slightly). There need to be mailings and incidentals from time to time so a balance is needed. Checks should be sent to **Stanley M. Lane**, Treasurer, 85 Old Colony Road, Wellesley Hills, Mass. 02181.

Bill Eddy is not retiring. The firm Metcalf & Eddy and Bill continue with no change in their methods of operation. . . . Our Secretary may hesitate to put in a personal note so his assistant is putting it in. You may have read of the disastrous flood on Memorial Day in northern New Jersey. Dix and Vi really got it and were unable to come to Alumni Day because of it. Federal money was granted after the area was declared a disaster one. Dix says his deep freeze is still draining and that he hopes it will be picked up soon for reconditioning.

On Monday, June, 10, a Memorial Service was held at M.I.T. for those alumni deceased this past year. In addition to the listed, **Paul M. Flagg** passed away on May 8. He was in Course II and had spent time in the engineering department of the Pullman Mfg. Car Company. Most of his time was spent in cost accounting for manufacturing plants, mainly foundry and machine shops; he was also an insurance broker. **Franklin B. Davis**, Course X, passed away on June 3. After graduation, he joined the U. S. Army Air Service in which he served as flying instructor until discharged in 1919 at Love Field, Dallas, Texas. Upon return to Cambridge he joined his two older brothers, both Tech grads, in carrying on the Frank H. Davis Company. **J. Justin Basch**, died May 24. He was a regional Vice President of the Class, residing in Philadelphia. Quoting from the 30 Year History: "Since graduation, I served in the Navy, worked in chemical laboratories, and



F. Alexander Magoun. "You may be glad to know that your teachings have proven to be the most valuable thing I

took away from M.I.T." (Comment of Richard J. Kulda, '44, a former student of Professor Magoun's.)

did sales engineering work until finally arriving at a combination of chemical and executive work that I now enjoy as well as make my living at. For recreation I play handball and fly my own plane. To me the Institute is still the best spot in the world to acquire a technical education. Member: American Chemical Society; Sales Executive Club; Philadelphia Zoological Society; Franklin Institute; Academy of Natural Sciences of Philadelphia," Degree—S.B., Course X-A. . . . The **Robert Erbs** and the **Richard Loengards** writing from Jasper National Park, Alberta, Canada, suggest it as a good spot for our 55th Reunion. Also, how about Bermuda?—any more suggestions? Let's have them.

Beginning with the September, New York '16-'17 luncheon, we are reverting to the first Thursday after the first Monday of each month—**Ray Brooks** please note. These luncheons are held at the Chemists Club, 52 East 41st Street, N.Y.C. At the May luncheon we were pleased to see **Bill Hunter**, who had previously moved to Hartford, Conn. Seems he wanted to pay his state income

tax. At the June luncheon, **Bill Neuberg** and your secretary, along with Herb Mendelson '16, joined the others at the New York Tech round table.—**C. Dix Proctor**, Secretary, P. O. Box 336, Lincoln Park, N. J. 07035. **Stanley C. Dunning**, Assistant Secretary, 6 Jason Street, Arlington, Mass. 02174

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The following was received in the Review Office from Theodore Magoun with the request that it be published in the Class Notes. It was, he said, his father's wish that this report be printed as given.

"Professor F. Alexander Magoun died on July 7, 1968 in his 72nd year. He has written his last column of notes for the Class of 1918. It was a task he performed for forty years, even ghost writing them for one five-year period while he was class president. He enjoyed doing it. Who, besides him, ever tried to give unity to each month's offering by starting the column with

a philosophical thought which could be used as a chord on which to string the pearls of news items from the brethren? What other M.I.T. class secretary ever began what he wrote like this: "Every man is defended by the sum of his good deeds. Take, Bill, for instance." And so he would go down through each item, talking about the classmate's good deeds. A few other samples of Magoun's opening sentences are worth reproducing to show the thought he must have given. "Life is a great bundle of little things. For some, the great bundle adds up a few fairly big things." "The geneticists tell us that heredity deals the cards. But each one of us has to play his own hand." Sometimes he used humor. Once it revolved around the opening parade at a bull fight. Some items of news he related to the picador, some to the toreador, some to the matador. Finally, introducing an account about himself he wrote, "Then comes the bull." But usually his opening was philosophical. Something like, "No man's life is worth more than the causes he devotes it to and risks it on."

The cause to which Magoun devoted his life was the improving of human relations through the long lever of influencing the lives of his students. It was also a risk, for not all of his colleagues understood or were in sympathy with their conception of his objectives, and certainly not with his methods. Nevertheless, in 1962 the Society for the Advancement of Management made Magoun an honorary life member in recognition of his contributions to human relations in industry. At least 16 books bore his name on the title page. Love and Marriage, resulting from an annual series of lectures he gave under the auspices of the Technology Christian Association, became a standard text used around the world. He also wrote numerous magazine articles, contributed to at least two minor encyclopedias, and lectured to students in over forty colleges in more than half of the 50 states. For over 30 years he did executive training for such companies as Raytheon, Allis-Chalmers, and Stanley Home Products. He was the first member of the class to get into Who's Who, reaching that mile post at the unusually early age of thirty-five.

Probably the professor would rather have a former student write his obituary than anyone else. Hence this quotation from a letter he received from Richard J. Kulda, '44, some 20 years after Kulda's graduation. "You may be glad to know that your teachings have proven to be the most valuable thing I took away from M.I.T." (There were others who also testified to this years after they had left college.) "Along with my sheepskins, which are largely of value only as a symbol, your penetrating insight has been of inestimable value to my personal happiness and business success. What amazes me most of all is your ability to transmit this insight to

individuals like myself. You were, of course, a maverick, and certainly an unorthodox teacher at M.I.T. But by virtue of your scintillating manner, wonderful sense of humor, and ability to express the abstract correctly, you succeeded where thousands have failed and are still failing every day." On the flyleaf of the copy of *Science is not Enough* which Vannevar Bush gave to him is written, "To Alexander Magoun, who supplied M.I.T. with some of the best teaching it ever had."

Could any teacher ask for a finer tribute? Certainly not Professor Magoun, for he believed "any teacher worth his salt unites his two loves—his students and his subject—and does it with enthusiastic competence." . . . He is survived by his widow, Carolyn L. Magoun, Jaffrey, N.H., his daughter, Mrs. Priscilla Brown, Colorado Springs, Colorado, his son, Theodore R. Magoun, Cochituate, Mass., (his other son, Richard M. Magoun died in 1952), his sister, Mrs. Clarence S. Gillett, Claremont, Calif., his brother, Dr. Harold I. Magoun Sr., Denver, Colo., and two grandsons, Peter R. and Matt S. Magoun, Cochituate, Mass."

It is with a heavy heart that I take over the secretaryship of the Class—for our own Alexander is no longer with us. Gone from these notes is the lilt, the philosophy, and the literary style which flowed so freely from his pen. No one was better known to all of us than Alexander—he was a most stimulating personality—we shall miss the excitement of his presence. There was a close bond between him and us. We shall miss him.

And now to our 50th. In one word—it was a wow. One hundred and twenty-six men and women attended—some had not been here in 50 years—and of course, many of the wives had never seen our environs—either the Tech on Boylston Street, or across the Charles. Thanks to our local women's Hospitality Committee, people were immediately introduced to each other upon their arrival—within a few minutes, camaraderie was established—a fresh vigorous class spirit was created that rivalled our days of 1914-1918. If I can record one accomplishment of the reunion, it was this fact—that we who were deprived of senior week and graduation exercises in 1918, had found ourselves and so established a new and strong loyalty to the class of 1918. The first get-together at McCormack Hall—a cocktail hour followed by a buffet—was fun, an opportunity to relax and exchange experiences. The next day—graduation exercises—we '18ers marched in cap and gown in the academic procession. Then luncheon as guests of President Howard Johnson in the Great Court, with our own **Bill Foster**, the featured speaker. On to Wianno, a wonderful dinner and an informal off-the-cuff talk by Bill Foster on the Geneva Conference.

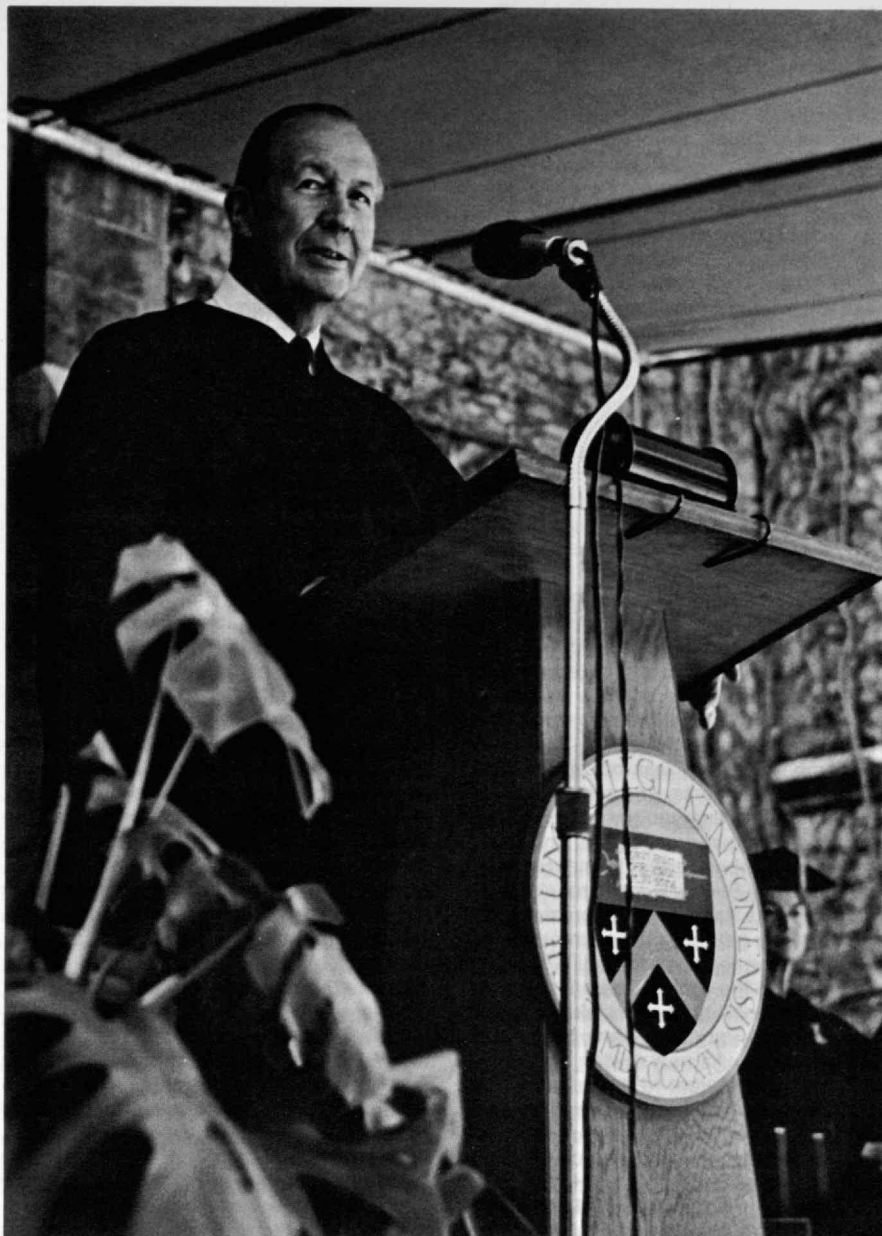
The next day—relaxation; air trips over the Cape in private planes, courtesy of **Carl Blanchard**, golf, shopping or boating. In the evening—class banquet—then dancing with the music and favors provided by Carl Blanchard and his orchestra of local business executives flown in from New Haven. . . . Sunday, the class picture (most of you now have seen it) and back to Cambridge with a reception at President Howard Johnson's home on campus; dinner at Stratton followed by a sober talk at Kresge Hall on the Kennedy assassination.

Monday was Alumni Day at M.I.T. with seminars, luncheon and dinner, and class gift announcements, including ours of \$1,400,000 with 95% of the class as participants—a new record!

The most distant classmate to be here was **Jorge Pena-Polo** from Bogota, Colombia. His career has been an outstanding one, building railroads, bridges, and large engineering projects in his native land. . . . In addition, he has contributed to the advancement of his country through service to his government. He and his charming wife were most modest—this was his first trip to the United States since his undergraduate days. He is now retired as a consulting engineer, but he may remain in these environs to study methods here before returning to Colombia. It was great fun having you and your Ana with us, Jorge—come back soon again. From time to time there will be flash backs from notes which I took in Cambridge and Wianno. Now to record some new developments.

On August first, Selma and I waved Bon Voyage to Elizabeth and **Julian Howe** who are in England for a three week holiday. About a month earlier, the four of us were among the guests at a special reception given by the trustees of the Boston Public Library for Sam Chamberlain on the occasion of the publication of his new book, "Etched in Sunlight," commissioned by them. It was a gala party with the leading figures in the literary and intellectual community of Boston attending. The book is the story of 50 years of painting, pictures, and writings by Sam. I recommend it to you all. . . . **Sax** and Louise **Fletcher** wrote in from Jasper Park saying that they were enjoying a months' vacation in Western Canada. Betty and **John Poteat** leave shortly for a three week trip to Hongkong and other places in the Orient with a group sponsored by the Brooklyn Museum of Art.

Among our travelers are the **Ned Longleys** who headed directly from the reunion to Hawaii. We are awaiting details of this trip to fill this column in the near future. Tell us about the volcanoes, the grass skirts, the beaches, the hula hula girls, and the leis, Ned. . . . Just received a note from **Bill Foster** who piloted through the Geneva Non-Proliferation Treaty. He has just returned to Washington after signing the pact



"Say what you want about this balance of mutual deterrence—or 'balance of terror,' if you prefer—it is at least a balance. It is not an ideal situation, but the way the world is organized and oriented today, it gives us what stability we have. Anything which upsets this thermonuclear equilibrium, suddenly causing a feeling of acute insecurity on one side or the other, obviously increases the general danger. The first objective of arms control, therefore, is to buy time by maintaining this equilibrium either at a fixed level, or preferably, on a downward plane. . . . continued forward motion in the arms control process is almost as important in itself as are the ends to be achieved; for every step along the way brings a new measure of hope that man can finally gain control over the monster he has created, and perhaps even evolve a more rational world order in the process."

William C. Foster, '18, Director of the U.S. Arms Control and Disarmament Agency, who piloted through the Geneva Non-Proliferation Treaty, as he addressed the commencement of Kenyon College on June 2. (He received an honorary doctor of humane letters degree from the college.)

for the United States with Secretary Rusk. Congratulations, Bill, and we are proud of you. Next most distant returnees were the **Rolie Folsoms** from San Jose, Calif. They hitched a trailer to their auto and took two months to come East, meantime learning more about our country, county by county, than most of us will ever realize. Please send us a capsule of *your* adventures for this column.

I list here the attendants of our 50th: Mr. and Mrs. **Harold V. Atwell**, Mr. and Mrs. **Julian M. Avery**, **Malcolm J. Baber**, Mr. and Mrs. **Henry Berliner**, Mr. and Mrs. **Eli Berman**, **Walter T. Biggar**, Mr. and Mrs. **Sidney B. Blaisdell**, Mr. and Mrs. **Carleton W. Blanchard**, Mr. and Mrs. **Stuart M. Boyd**, Mr. and Mrs. **Theodore Braaten**, Mr. and Mrs. **George S. Brewer**, Mr. and Mrs. **T. V. Brosnahan**, Mr. and Mrs. **S. Harrison Chamberlain, Jr.**, Mr. and Mrs. **Samuel Chamberlain**, **John W. Clarkson**, **William L. Collins**, **Philip**

B. Craighead, **Charles E. Dimock**, Mr. and Mrs. **Charles W. Dow**, **George O. Ekwall**, Mr. and Mrs. **Saxton W. Fletcher**, Mr. and Mrs. **James A. Flint**, Mr. and Mrs. **Rolie A. Folsom**, Mr. and Mrs. **William C. Foster**, Mr. and Mrs. **Clarence C. Fuller**, **Donald C. Goss**, Mr. and Mrs. **Alfred P. Grossman**, Mrs. **John M. Hanley**, Mr. and Mrs. **Edwin B. Harrall**, Mr. and Mrs. **Craig P. Hazelet**, Mr. and Mrs. **Julian Howe**, Mr. and Mrs. **William A. Jones**, Mr. and Mrs. **Harry L. Katz**, Mr. and Mrs. **John W. B. Kennard**, Mr. and Mrs. **John W. Kilduff**, Mr. and Mrs. **John T. Kiley**, Mr. and Mrs. **Thomas W. Knowland**, Mr. and Mrs. **Nathaniel Krass**, Mr. and Mrs. **Henry Lacey**, Mr. and Mrs. **Herbert Larner**, Mr. and Mrs. **Harry C. Levine**, Mr. and Mrs. **Leonard I. Levine**.

Mr. and Mrs. **Edward Longley**, Professor and Mrs. **F. Alexander Magoun**, Mr. and Mrs. **Ralph G. Mahoney**, Professor and Mrs. **John R. Markham**, Mr. and Mrs. **Bruce M. McDill**, Mr. and Mrs. **Herbert**

McNary, **Sister St. John Nepomucene** (Elizabeth Fennessey), Mr. and Mrs. **Hall Nichols**, **Gretchen A. Palmer**, Mr. and Mrs. **Jorge Pena-Polo**, Mr. and Mrs. **Frederick B. Philbrick**, Mr. and Mrs. **John R. Poteat**, Mr. and Mrs. **Walter H. Robertson**, **Wingate Rollins**, Mr. and Mrs. **Edwin F. Rossman**, **R. Robinson Rowe**, Mr. and Mrs. **George A. Sackett**, Mr. and Mrs. **Albert F. Sawyer**, Mr. and Mrs. **Max Seltzer**.

Philo S. Shelton, Mr. and Mrs. **Howard Simonds**, Mr. and Mrs. **Arthur Smith**, Mr. and Mrs. **Granville B. Smith**, **Harold V. Sturtevant**, **Charles H. Tavener**, Mr. and Mrs. **Albert C. Walker**, Mr. and Mrs. **C. H. Watt**, Mr. and Mrs. **Sumner K. Wiley**, Mr. and Mrs. **Arthur Williams**, Dr. and Mrs. **Theodore P. Wright**. Please send any and all items of interest to your Secretary—**Max Seltzer**, 125 Harvard Avenue, Allston, Mass. 02134

Lloyd Sorenson and his wife have just returned from Singapore where he has been a shipbuilding and ship repair consultant for the Singapore Government. They are going back to finish the year, but expect to be at M.I.T. reunion next June. . . . **Larry Riegel** has recently resigned as Chairman of both the Board of Directors and the Executive Committee of Riegel Paper Company. **Roger Hall** writes that he is still active in consulting work in Virginia, Maryland, and the District, after trying retirement for six months. He lives on the Maryland banks of the Potomac. **H. H. McClintic** writes that his "health is good, drinks enough, plays golf enough but not well enough, still trying to make a nickel." Captain **Edward Saunders** and his wife have taken a two-bedroom apartment in Vinson Hall, being built outside Washington, D.C. for retired Navy, Marine, Coast Guard retirees and families for occupancy May 1, 1969, and will be leaving Asheville, N. C. **Robert McMullin** has just returned from an extended trip to Korea where he was a consultant to Oriental Chemical Industries, through A.I.D. of the U. S. State Department. **Alfred A. Johns** retired in 1960 from the vice-presidency of Rochester Institute of Technology, Rochester, N. Y., and now lives at 38 Woodland Place, New Port Richey, Fla. **Edmund C. Adams** is still enjoying retirement from Gulf States Utilities Company after eight years of relative inactivity. **Edgar F. Seifert** says he has had a full schedule of non-paying jobs since he retired some years ago. One of his jobs is Educational Counsellor for the Institute, which involves roaming over north central and northwestern Indiana interviewing applicants for admission to M.I.T. Currently, there are four of 20 he interviewed who are going to M.I.T. this fall.

Your secretary and the following '19 men were at Alumni Homecoming this June 9, 10, 1968: **Frank Adams**, Mr. and Mrs. **Roy Burbank**, **E. J. Flynn**, Mr. and Mrs. **Albert Kaufman**, **Paul Sheeline** and **Dean Webster**. On Monday, June 10, a memorial service was held at the M.I.T. Chapel for M.I.T. alumni who had been reported deceased between June 1, 1967 and June 1, 1968. Among those reported were the following members of the Class of 1919: **Lewis J. Atwood**, **Wynn Gaylord**, **Arthur F. Kaupe**, **Jacob Lichter**, **A. Lionel Reid** and **Hyman G. Spector**. . . . Our 50th Reunion comes in June, 1969, and announcements are forthcoming from our Reunion Committee. We are also planning to publish a booklet with alphabetical and geographical distribution lists, with addresses of all living 1919 classmates. This will help communications so that we will all know who is coming and how to contact our old friends of 50 years ago. In the past three years about 70 to 100 members of Classes '16, '17 and '18 returned for their 50th. This drops to 15 to 25 attending at the 55th and five to 15 for those classes attending their 60th

Reunion. The 50th is the time for everyone to get back on campus.—**Eugene R. Smoley**, Secretary, 30 School Lane, Scarsdale, N.Y. 10583 (1111 Casuarina Rd., Delray Beach, Fla. 33444 (from November to April))

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Welcome to this 48th consecutive year of our monthly meetings around the friendly fireside of the Class of '21. A special welcome from all the Class Officers to you, dear classmate, if you are one of the newly constituted members of our fireside group, which is increasing markedly each year through the generosity of more and more of our classmates in annual giving to the Amity Fund. This promises to be another big year for the Class, as we approach that major milestone, our 50th Reunion in 1971. We sincerely hope you will take an active part. Write us about your activities and tell us you and your wife are making plans to be among the large number who will return for those unusual 50th Reunion festivities and the unique honors which M.I.T. will bestow upon the returning group at that time. . . . Twenty-five members of the Class of '21, 17 with their wives and guests, comprised the group of 42 who enjoyed the fun and fellowship of the various events on campus in Cambridge last Homecoming, June 9 and 10. Formerly just prosaic Alumni Day, its flavor has become so much a family gathering that a more appropriate name was adopted. A '21 group went to the Pierce Boathouse on Sunday afternoon to see **Irv Jakobson**, Captain of the first M.I.T. crew, assist in the christening of a new rowing shell. Part of our group went to the informal buffet and musical Singalong that evening. Another portion inaugurated what is hoped will be an Annual Class Dinner Meeting at the Charter House Hotel. Seen at the latter were Maxine and **Cac Clarke**, Maida and **Ed Dubé**, **Sumner Hayward**, Ruth and **Irv Jakobson**, Kim and **Don Morse**, Helen and **Ray St. Laurent**, and Rigi and **Saul Silverstein**.

Monday morning afforded time to greet old friends among alumni and faculty. Special departmental and organizational coffee hours were interspersed with lecture-demonstrations of amazing new frontier developments in learning, lasers, synthetic foods, sensory aids for prosthetic devices, replacement parts for humans, automatic computer library information retrieval, and the arts at M.I.T. Many of us joined with our distinguished new classmate, President **Howard W. Johnson**, and Mrs. Johnson, at the annual impressive Memorial Services in the Chapel for alumni who passed away during the year. Included were 14 from the Class of '21, whose names we recorded in various issues of the last volume of the *Review*. We all then congregated at buffet luncheon in the Great Court, followed by various award and gift ceremonies. The M.I.T. Libraries acquired their millionth book. President Johnson gave fascinating

commentary on Technology's status and outlook.

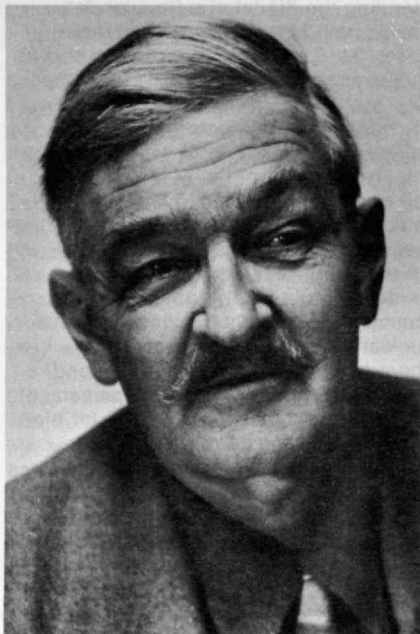
The afternoon took on a new form in a panel report and discussion of the *Technology of China Today* as it is considered to have potential influence upon Western World economics, social and political sciences. We then had cocktails together in the du Pont Athletic Center as a prelude to the banquet, sans speeches, at which four tables of our classmates and their guests enjoyed an elegant roast beef dinner. Then to Kresge Auditorium for the several acts on the evening's program of entertainment. The day ended with dancing to two musical organizations in spacious rooms of the new Student Center. Among those of our Class present for the weekend were **George Chutter**, Maxine and **Cac Clarke**, Kay and **Ed Delany**, Maida and **Ed Dubé** and their guest, son Paul, **Harty Flemming**, Sara and **Harry Goodman**, **Bob Haskell**, **Sumner Hayward**, **Jack Healy**, Ruth and **Irv Jakobson**, **Algot Johnson**, Laurie and **Chick Kurth**, Emma and **Al Lloyd**, Helen and **Bob Miller**, Kim and **Don Morse**, Kay and **Phil Nelles**, **Herb Rheinhard**, **Paul Rutherford**, Helen and **Ray St. Laurent**, Anne and **George Schnitzler**, Celia and **Steve Seamos**, Rigi and **Saul Silverstein**, **Ted Steffian**, Anna and **Bill Wald**, Pearl and **Al Wechsler**. **Paul N. Anderson** of Jamestown, N.Y., was in Boston briefly for his 50th Andover Academy Reunion and many expressed regrets that he was unable to join us. If you haven't been back to M.I.T. for many years, you must see the changes that have been made and still are going on in order to believe them. It's worth a special trip and we hope you'll schedule it for next Homecoming—and certainly for our outstanding 50th Reunion.

The 1968 National M.I.T. Alumni Officers' Conference, September 6 and 7 at Technology, saw a number of our classmates gather to learn how better to carry on their diverse functions as class and alumni club officers, Amity Fund and Reunion Gift committeemen and members of the M.I.T. Educational Council. Most of our Class officers were there, including **Ed Farrand**, who phoned from his home in LaJolla, Calif., that he would make the trip. . . . This year's Alumni Seminar has been tentatively set for November 9 through 11. Its program is directed toward educational enrichment for alumni, their wives and members of the faculty. If you have not received advance notification, contact the Alumni Association immediately for registration information. Our Class President, **Raymond A. St. Laurent**, 47 Gerard Street, Manchester, Conn. 06040, has announced that our Fourth Interim Reunion, to be held outside the United States and our third visit to Mexico, will be held concurrently with the 21st Annual Fiesta of the M.I.T. Club of Mexico City, next March 13, 14 and 15. As in previous years, those who attend will want to arrange their own tours of Mexico before or after the Fiesta and reserve as much time as possible to

see the remarkable recent changes in Mexico City, which were made for the celebration of the Olympic Games. **Leon A. Lloyd** has accepted the Chairmanship of our Interim Reunion Committee and **Edouard N. Dubé** will serve as Co-Chairman. You should shortly have a notice with some details. For additional information, write to Al Lloyd or Ed Dubé at the addresses listed at the end of these notes or telephone them at 401 596-4142 or 617 944-1004, respectively.

A new book by **David O. Woodbury**, Shore Road, Ogunquit, Maine 03907, is entitled *You're Next on the List*. It is available from the publishers, Western Islands, Belmont, Mass. 02178 and Los Angeles, in paperback at \$1, post-paid. If you order directly from Dave, he says he'll supply autographed copies. The book is the third in the series of his Dean Riam novels and is a satire on modern bureaucracy, set in the fictional town of Ludley, Mass., and involving the fictional engineering university, Eastern Technological Institute, on the banks of the Charles River. After having written some twenty successful books related to the factual interpretation of science, Dave has now spun a yarn as well as expounded a serious message in treating a plot to reduce an American town to submission. Maxine and your Secretary dropped in on India and Dave at their lovely modern home overlooking the Atlantic Ocean and spent a pleasant afternoon with a most interesting couple. Tastefully exhibited were a number of the famous marine oil paintings done in Ogunquit by Dave's prominent artist father, the late Charles H. Woodbury, '86. Dave autographed for us copies of the new novel and *The Great White Mantle*, the volume he wrote several years ago on the ice ages and the coming of man, published by Viking Press. Good reading.

Henri Pell Junod, 2000 Union Commerce Building, Cleveland, Ohio 44115, a member of the important Development Committee of the M.I.T. Administration, retired in 1966 as Vice Chairman of the Board of Pickands Mather and Company, with whom he had then been associated for 40 years in various managerial capacities. He writes, in part: "I enjoy retirement thoroughly, although I still continue as a Director and Chairman of the Executive Committee of the company, and as a Director of the Lubrizol Corporation of Cleveland. I spend several months in our apartment in Naples, Fla., and commute back and forth when it is necessary to go to meetings. My son was graduated from Choate and Trinity and is now teaching in our country day school here in Cleveland." Harry has been missed at our reunions and we hope he and Mrs. Junod will be able to join us in Mexico next spring and, of course, at our 50th Reunion. Swimming, wrestling, varsity track and relay team star in our undergraduate days, he was active in a host of other student endeavors. He has been similarly engaged in numerous business,

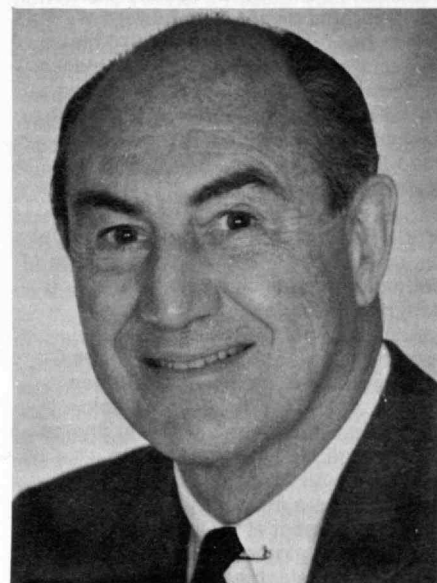


David O. Woodbury

industrial, professional and civic organizations. At retirement, he had also been President and Director of Ash-tabula and Buffalo Dock Company, Detour Dock Company, Erie Dock Company, Hamilton Supply Company, Marquette Dock Company, P. and E. Coal Dock Company, James Pickands and Company, Portage Coal and Dock Company, and Toledo Lakefront Dock Company; also Vice President and Director of Interlake Steamship Company, Toledo Coke, Inc., Olga Coal Company, Milwaukee Solvay Coke Company, and Interlake Steel Corporation. He had been Chairman of the Board of the National Coal Association, a past president of the American Coal Sales Association, a past director of both the Bituminous Coal Association and the Lake Carriers Association, and a member of the American Iron and Steel Institute. His memberships include the Union, Tavern, Chagrin Valley Hunt, Mid-Day and Kirtland Country Clubs in Cleveland; the Colonial Lords of the Manor and River Clubs, New York; and the Naples Yacht Club, Florida. A director of the Y.M.C.A. and the Cleveland Chapter of the American National Red Cross, he has also served in many top echelon capacities for the Community Chest and the United Appeal of Cleveland. He married the former Gertrude Busch of Cleveland and they have one son, Henri Pell, Jr. Mrs. Junod has been an ardent supporter of the Garden Club of Cleveland and a trustee of both the Cleveland Garden Center and the Lake Erie Opera Association. The Junods spent the last summer in Europe.

Through the courtesy of mutual friends, Maxine and your Secretary had dinner with Mrs. C. Arthur Newton, who has been retained on the Class Roster at her own request. Betty has moved to a new address in a retirement community and can be reached at 13108 Old

Nassau Road, 112-B Rossmoor, Jamesburg, N.J. 08831. The late **C. Arthur Newton**, Delta Tau Delta, had been with the American Viscose Division of the FMC Corporation. . . **Donald W. Randolph** gives a new home address at 1959 Verde Via, Escondido, Calif. 92025 and we assume he has now retired as manager of commercial products for Zenith Plastics Company, Gardena, Calif. Right, Don? . . **Herbert K. Nock** retired in 1959 as sales manager of the Smithcraft Lighting Division of the A. L. Smith Iron Company in Chelsea, Mass., and makes his home at 2376 S.E. 14th Street, Pompano Beach, Fla. 33062. Herbie reports his family includes four children and eight grandchildren. . . **LeRoy M. Hersum** has changed his mail address to that of his home, 14 Corinthian Lane, Marblehead Neck, Mass. 01945, and we are not sure whether he has retired from his consulting engineering practice, which he carried on from his office at 6 Beacon



Henri Pell Junod

Street, Boston, Mass. 02108. Roy specialized in the structural design of buildings foundations and bridges. He and Anita have two daughters, Lois, a research biologist, and Cynthia, an occupational therapist. . . **George S. Piroumoff** now receives mail at 570 Park Avenue, New York, N. Y. 10021. Gladys reported last year that he had been ill for some time and unable to attend to business matters. Write to George. . . **Harry M. Ramsay** says his home address is now 10222 Mountain View Drive, Sun City, Ariz. 85351. He retired in 1961 from his own business, Wholesale Tire and Supply Company of Minneapolis. Harry and Agnes have two married sons, a married daughter and 10 grandchildren.

Assistant Class Secretary **Edwin T. Steffian** writes that the firm name of his long-established architectural and planning organization has been changed from Edwin T. Steffian and Associates,

Inc., to Steffian, Steffian and Bradley, Inc. Ted's son, Peter, now becomes a headlined member of the firm. The offices remain at 19 Temple Place, Boston, Mass. 02111, where the telephone number is 617 542-1940. . . . The *Wall Street Journal* notes that **Oliver L. Bardes**, President of Bardes Corporation and also of IlSCO, both of Cincinnati, Ohio, has been elected a director of Electronics Capital Corp., a small-business investment company. . . . **Andrew D. MacLachlan** has retired as supervising engineer of B. F. Goodrich Footwear and Flooring Company, Watertown, Mass., and has left the Boston area. He now receives mail at Box 117, Hoosick, N.Y. 12089. A member of the American Society of Mechanical Engineers and a registered Professional Engineer, Andy is a past commander of the U. S. Coast Guard Reserve. He and Muriel have a son and daughter and two grandchildren. . . . **Eugene L. Harlin** writes: "I retired as a highway contractor as of July 1, 1958. According to the label in my hat and my county tax statement, I am now a 'Country Squire,' whatever that means." . . . **Edward W. Noyes** has advised completion of his seasonal move to his summer residence at Coxton Lake, R.D. No. 2, Thompson, Pa. 18465. Ed, who retired in 1960, will be returning about now to his home at 1410 S.E. 7th Avenue, Pompano Beach, Fla. 33060.

Mrs. John Lousin Spiczak of Fort Lauderdale, Fla., has announced the marriage of her daughter, Janice Dee, also the daughter of the late Mr. Spiczak, to Lieutenant George Daniel Hawes, younger son of our Alex and **Munroe C. Hawes** of 320 Boston Boulevard, Sea Girt, N. J. 08750. The wedding took place last September 2 at Miami Shores, Fla. George, a First Lieutenant in the Marine Air Corps, was recently graduated as a helicopter pilot and Alex was present at the ceremony in Pensacola to pin on his wings. He is a graduate of Lehigh and his bride attended the University of Western Florida. . . . **Benjamin F. Williams** has moved to a new home at 220 Douglas Street, Portland, Maine 04102. Ben is the owner of the Williams Savings and Loan Company, 349 Cumberland Avenue, Portland 04101. . . . **Egbert W. Olcott** has retired from the technical staff of the Bell Telephone Laboratories, Murray Hill, N. J., and gives his new home address as 56 Springtown Road, Long Valley, N.J. 07853. . . . **William F. Lawrence** says he has moved his home to 6441 Horton Circle, Norfolk, Va. 23513. Bill hasn't yet returned the personal data form sent out by the Class at the time of our last reunion and we have no information on his activities. Want another blank, Bill? . . . It is now **Captain Preston W. Smith**, according to a recent communication received by M.I.T. The former professor of mathematics retired from St. Lawrence University in 1966 and makes his home at 20 Cliff Street, N. Weymouth, Mass. 02191.

Those of the Class who are interested in

attending the '21 Interim Reunion in Mexico next March should read the report "M.I.T. in Mexico—A Fiesta and an Anniversary," pages 104 and 105 in the July/August, 1968, issue of the *Review*. The concluding paragraph pays such well-deserved tribute that we quote it in full: "No account of the M.I.T. contribution to Mexican economic life would be complete unless it included the big share provided by one of the grand old men of Mexican science, **Manuel Sandoval Vallarta** '21, one of the three commissioners on the Mexican National Nuclear Energy Commission. Everywhere he is revered for his ability and competence and the growing company of M.I.T. men in Mexico admire him for his steadfast loyalty to *Alma Mater*." Maxine and your Secretary were privileged to visit Val and his charming wife, Maria Luisa, in their lovely home during our '21 reunion in Mexico in 1967, when we were invited to a Sunday afternoon picnic along with Helen and **Ray St. Laurent**, Ruth and **Irv Jakobson** and Anne and **Mel Jenney**. Both Maria Luisa and Val stem from a long line of Mexican patriots who served their country to a stellar degree that would make most absorbing reading if it could be assembled in book form. They are both carrying on in the best family traditions to further the steady and amazing progress of the Republic of Mexico. . . . The wide sphere of influence of M.I.T. men is further demonstrated by world traveler **Saul M. Silverstein**, Chairman of Rogers Corporation, Rogers, Conn. 06263. A report from Saul on Thailand and another on Japan reflect the increasingly international aspect of American business and our pattern of management, so fervently espoused by Saul. Even his business card, attached to the Nippon article, has three lines of Japanese, which we'll have Saul translate for your edification in a later issue! . . . **Irving D. Jakobson** of Northfield Road, Glen Cove, N.Y. 11542, has been elected to the board of directors of the newly-organized M.I.T. Club of Long Island. He also serves the club on the committee handling the summer placement program for Technology undergraduates. . . . Maxine and your Secretary had a delightful trip last summer on a visit to Helen and **Ray St. Laurent** at their fifty-five-acre shore home amidst the gorgeous scenery of the Island of Vinalhaven, Maine, an hour-and-a-half ferry ride off the coast of Rockland. Fishing, boating, sightseeing, socializing with interesting neighbors were just some of the attractions on the schedule of our hospitable hosts. Granite hills and deep quarries once made the island famous as the source of huge completed columns and other fine stone work for such edifices as the Cathedral Church of St. John the Divine in New York City. The distant Camden hills, often shrouded in fog, serve not only as background for windjammers in full sail, lobster pot markers and myriads of tiny islands almost swallowed by tall tides, but also as practical towers for the microwave telephone systems. Ferries of all sizes

interconnect islands and the mainland. Maine lobster, that finest of all delicacies, is, of course, the *piece de resistance*, and our gracious hosts served it bountifully. The guest book at "Saints' Haven" has a number of familiar signatures of our classmates and there would certainly be many more if we had space to describe the visitor's enjoyment more adequately. Maxine has completed a couple of oil paintings of Vinalhaven scenes and is busy on a number of others in between serving as judge for an excellent art show at Bell Telephone Laboratories in Holmdel and for one given by the American Artists Professional League at a Spring Lake hotel near our Brielle home.

Helen and Ray have just written that Ruth and **Irv Jakobson** will drop in at "Saints' Haven" on a fall cruise to Nova Scotia. They taunt us with news of good mackerel and flounder catches. They tell of a miniature '21 reunion in Center Lovell, Maine, with Rebecca and **Elmer W. Campbell** and Theona and **Albert S. Genaske**. The Campbells had dropped in to see the Jakobsons in Long Island on their return to their home in Lovell, Maine, from several months in Florida. Theona and Al had been in Hawaii and Florida and had closed their Fryeburg, Maine, home to go to their summer cottage on Lake Kezar in Center Lovell. Both couples plan to join '21 at the Interim Reunion on next March and at our 50th. **Edouard N. Dubé**, Class Agent and Consulting Engineer, 120 Tremont Street, Boston, Mass. 02108, writes, in part: "At our last town elections, I was elected a member of the Reading Housing Authority. It is proposed to build a second project for the elderly and it was felt I might contribute to the planning and construction phases. Also, at a recent Town Meeting, the Selectmen were instructed to prepare documented recommendations for action on our abandoned high school. A committee was appointed, with me as Chairman, to assemble facts and figures. This is a real problem, because there is sentiment to retain the building and reluctance to maintain it if it cannot be made usable at a reasonable cost and operated to good advantage as a community center."

A card from Assistant Secretary **Sumner Hayward**, picturing the Lakes of Killarney, says: "This is to us the loveliest area of all England, Ireland, Scotland and Wales. Betty and I took a delightful two-hour ride in a jaunty cart. In Dublin, we attended the Abbey Theater and saw two tragicomedies. An Irish cabaret was also enjoyable." . . . Through the courtesy of **Ed Farrand**, Class Agent and Class Estate Secretary, and **Ed Dubé**, Class Agent, we have the final tabulation of the 1968 Amity Fund, which shows that the Class of '21 has the No. 5 spot out of 69 class units reported, in the amount of total giving to the fund for the 1967-1968 season. This is truly a remarkable record, especially since it represents a rise from seventh place in this category last year. The total amount you gave, dear

classmates, is \$88,981 (against \$71,717 a year ago), which will help tremendously to swell our 50-year gift to M.I.T., since the total giving and deferred gifts in wills for the five years ending in 1971 will be accumulated for our gift. All donors to the Amity Fund receive a subscription to the *Review* and we are most pleased to know that we now have an augmented audience of more than 52 per cent of the Class as readers—another marked increase over the 46 per cent of last year. We hope you'll volunteer a letter to your secretaries right now for all your friends to read and help us maintain this column. Our appreciation goes to the two Eds, who tell us, in concert: "How can words ever express our profound gratitude and admiration for each of the members of our great Class of '21! More than half of our classmates have generously contributed and enabled us to exceed the previous high we attained last year by 25 per cent. Every year since we undertook the Class Stewardship of the Fund, many years ago, our Class total has exceeded that of the year before. Please thank for us all who have responded so well to help us continue to build M.I.T. and its faculty and students. Please also ask those who are not current contributors to weigh in their own consciences the great value of their immediate and continuing support for a pre-eminent university which brought them into the business, industrial, and scientific worlds." To which we'd like to add our own appeal that you keep on reading '21 news and write to your secretaries to help us expand our coverage to meet the needs of what we hope will be an even larger reading audience. Thanks a million!

EXTRA! Ed Farrand has just phoned us again from his California home with the good news that Graciela and **Helier Rodríguez** arrive in this country during the fall to take up permanent residence in Tampa, Fla. Everyone will be glad to know these two revered people will again be close to all of us. . . . Calendar of Events: '21 Interim Reunion at the Annual Fiesta of the M.I.T. Club of Mexico City, March 13 through 15, 1969; Homecoming Weekend, June 8 and 9, 1969; 50th Reunion, June 10 through 14, 1971. . . . Happy Thanksgiving! Your letter now will make ours extra thankful! —**Carole A. Clarke**, Secretary, 608 Union Lane, Brielle, N.J. 08730; **Edwin T. Steffian**, Assistant Secretary, Steffian, Steffian and Bradley, Inc. 19 Temple Place, Boston, Mass. 02111; **Sumner Hayward**, Assistant Secretary, 224 Richards Road, Ridgewood, N.J. 07450; **Leon A. Lloyd**, Chairman, Interim Reunion Committee, 35 Spruce Street, Westerly, R.I. 02891; **Edouard N. Dubé**, Co-Chairman, Interim Reunion Committee, 216 Woburn Street, Reading, Mass. 01867

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It just doesn't seem right to be preparing Class Notes for fall on a beautiful 75° summer's day on the shores of

Lake Erie in Buffalo. However, giving up a golf afternoon because of '22 Notes is not too great a sacrifice. Since our last report we have had our Presentation Party, Alumni Day, and a summer of activity. Our class election continued Parke D. Appel as President and Reunion Chairman and Donald F. Carpenter as Senior Vice President and Estate and Reunion Gift Chairman. . . . The big Presentation Event was held on Old Farm Road in Dover when Parke and Madeline Appel provided a beautiful home and yard, exceptionally fine libations and food with the best of friends from the Class of 1922. Subject to correction those present included: Mr. and Mrs. **Win Potter**, Mr. and Mrs. **Dale Spoor**, Mr. and Mrs. **Tommy W. Thomson**, Mr. and Mrs. **Yardley Chittick**, Mr. and Mrs. **George Dandrow**, Mr. and Mrs. **William Russell**, Professor and Mrs. **John Wulff**, **Abbott Johnson**, **Frank Kurtz**, **Robert Tonon**, **Marjorie Pierce**, **Ken Sutherland**, **Warren Ferguson**, **Fearing Pratt**, Mr. and Mrs. **William L. Hyland** and **Dorothy and Whitworth Ferguson**. The following day at the Institute for luncheon and dinner we met most of the above and Mr. and Mrs. **Morris Gens**, Mr. and Mrs. **Oscar Horovitz**, **Julian Lovejoy**, **Roscoe Sherbrooke**, **Florence Stiles**, **William Riley**, Mr. and Mrs. **(Buck) Eacker**, **Randy Myer**, Mr. and Mrs. **C. Paul Baker**, **Dr. John Strieder**, **Meyer L. Alpert** and **Lester C. Lewis**.

We are asked to announce that the Classes of 1921 and 1923 are interested in a special Reunion in Mexico City in early March 1969. Will you please notify your Secretary or Parke Appel if you would be interested in joining this outstanding party? It will be a bash! You may have noticed in the *Review* a photograph of the presentation by our President to Professor **John Wulff**. This was made during the cocktail hour on Parke's front porch. We have been honored to have Professor Wulff in the endowed Faculty Chair for the Class of 1922. Also in the July/August issue **Horace** and **Catherine McCurdy** are pictured christening an additional eight-oared shell at the Pierce Boathouse this spring. We were sorry to miss these two wonderful people at our Reunion but Mac had to return to Seattle before graduation. In the meantime, his book *Don't Leave Any Holidays* has come off the press to the great enjoyment of his many friends. Their welcome mat is always out for classmates who arrive in the Seattle complex. . . . Alumni Day included the typical extremely interesting program. Just to be sure of the weather, the luncheon was moved from the tent in the Great Court into the Field House where we heard the usual and unusual experiences of classmates—all to be again enjoyed at the banquet in the evening before final adjournment to various home ports. We missed those of you who couldn't make it and ask that you try harder next year. Cards were sent to some of our absent members and appreciative replies received. **Jack** and **Hardy Liecny** wrote that Jack is feeling much better and has come back to

judge Corgi's at the Beverly Hills Show. They report that the cobalt treatment was rough but thorough and only regret that they were not able to be with us in June. **Parke Appel** has written of his experience on the jury in June and regarding his slide pictures taken during their trip to the Southwest. Parke and Madeline travelled about 3,600 miles via auto with a "camper" trailer, starting from Albuquerque and taking in all the national monuments and parks between Santa Fe, the Grand Canyon and Mesa Verde in southern Colorado. They offer a complete evening of Wild West entertainment for any of you who drop in.

Oscar Horovitz has told us of his invitation to the western New York area the latter part of October. We hope to see some of his prize-winning pictures at this time. He continues to win newer and more unique awards as one of the country's top amateur movie photographers. His lectures and films are in great demand, especially his presentation of *The Tourist's Russia*. Just pinning on his 90 awards in national and international competition must be quite a task! **Dale D. Spoor** of Richmond has sent congratulations and also "Get Well" cards to **Henry S. Dimmick** of Cataumt. We send special regards to Stew. An announcement tells of the July marriage of **Platt C. Benedict** to Mrs. Leah Williams in Los Angeles. His last address noted was Cape Province, South Africa. . . . **C. Ford Blanchard** tells us that he is still at work but is rapidly on the way to retirement. He has been on the staff of the Federal Power Commission in Washington and able to use his previous long experience in the security markets. He writes: "I say I am at work, but this is not for long for I will be retiring at the end of September with 26 years of government service to my credit. This affords an annuity, government style, which should keep us sheltered, clothed and fed, and in cocktail ingredients until we are ready for the glue factory or the dollar goes all to hell, whichever comes sooner. My good fortune so far as these arrangements are concerned is entirely due to the sage advice of my wife, Mabel, who at the end of the war persuaded me to forsake the life of a security analyst for the prosaic career of a public servant. (Has anyone read *The Money Game* by Adam Smith?) Life in Washington manages to be fairly interesting and sometimes even exciting. It is a different city from what it was when we first came here in 1941 in response to Navy Department orders. It was then a sleepy southern city; now it's taken on all the aspects of a metropolis with attendant evils. The aftermath of Martin Luther King's assassination was not pleasant to contemplate. The Poor People's Convention has also been a disturbing factor. This contributed to the closing of the Willard Hotel, and I hear that some of the newer hostelrys are in trouble. Tourists who once came here in great numbers have been scarce this year. No one likes to remain in town on an evening.

Living in Virginia helps. The M.I.T. Club of Washington has shaken off its lethargy and the seminars which it has sponsored have been most interesting. Jack Phillips, '38, who has spark-plugged much of its activity has been a good leader. At a recent session, I was pleased to run into **Karl Schoenherr**, who held a very important post at the Carderock naval activity until his retirement. We will probably remain in Falls Church following retirement, avoiding such retirement ghettos as California or Florida. Most of our friends are here and there's hardly any point in returning either to New York, which is overcrowded, or to Boston where I wouldn't know a soul. Around Washington there's always a chance of picking up a consulting job once in a while, and I have accumulated a fairly impressive list of contacts around the government and among attorneys who practice before the regulatory agencies. We leave for Bermuda in September. It will mark the 35th anniversary of our wedding. On that occasion we got there in 48 hours out of New York on the SS Monarch of Bermuda. This time we will fly Eastern and get there in two hours from Dulles! Best wishes to all classmates. Sincerely, **C. Ford Blanchard.**"

William G. Rapp of Larchmont writes that he retired from Bethlehem Steel Company in 1962 as Assistant General Manager of Erection and is presently acting as Safety Consultant for a New England firm of fabricators and erectors of structural steel bridges and buildings; "in order to help keep young and healthy." His recently published book is entitled *Construction of Structural Steel Building Frames*, a 344 page volume priced at \$12.95 by John Wiley and Sons. The table of contents makes this book sound like a "must" to those in the steel erection business. We again note that **William B. Elmer** has joined the ranks of Beethoven, Schumann and Debussy as a composer of genuine quality classical piano music. We hope to hear him perform at our next Reunion. It is noted that Theodore P. Shlikoff reached his 80th anniversary this spring and is enjoying retirement in Alabama. **C. William Perkins** has retired from the candy and food industry and will "take it easy in sunny Florida." **Clyde A. Benson** retired from the pulp and paper industry in June and will live in Winthrop, Maine. Clyde and his wife have the welcome mat out for 22-ers. . . . A memorial service was held in the Chapel on Alumni Day for the Alumni who died during the previous year. Among the 22 names listed for '22 were those of **Marion S. Dimmock, Fred C. Koch, David M. Minton, Jr., Harry M. Noelke, George P. Schumacker, Jr., Dudley Tait, and Earl R. Thomas.** The sympathy of the Class is extended to their families.

We have received the following changes of address: **Russell Hopkinson**, East Hampton, N.Y. 11937; **Howard B. Upham**, Pompano Beach, Fla. 33062; **C. William Perkins**, Pompano Beach, Fla. 33062;

Francis G. Wells, Sarasota, Fla. 33577; **William W. Harris**, Pompano Beach, Fla. 33062; **Arthur Slepian**, Bridgeport, Conn. 06608; **Ronald G. MacDonald**, Jackson Heights, N.Y. 11372; **Donald F. Carpenter**, West Chop, Martha's Vineyard, Mass. 02573; **Clyde A. Benson**, Winthrop, Maine 04364; **John G. Campbell**, Pocono Lake Preserve, Pa. 18347; **Charles H. Taylor**, Nantucket, 02554; **Irving Whitehouse**, South Euclid, Ohio 44121. . . . Among the other welcome mats listed above, please include that of your Secretary in the garden spot of the world, on the shores of the loveliest lake in our country—but if you can't stop by, please write! Good Luck and Good Health to you all!—**Whitworth Ferguson**, Secretary, 333 Ellicott Street, Buffalo, N.Y. 14203; **Oscar Horovitz**, Assistant Secretary, 33 Island Street, Boston, Mass. 02119

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One hundred and twenty—classmates (65), wives (51), guest (1), child (1), and grandchildren (2)—enjoyed three of the most beautiful summer days possible at our 45th Class Reunion at the Blue Water Resort Hotel, Bass River on Cape Cod. . . . **Howard F. Russell, Elliot P. Knight, Edward S. Averell, and James A. Pennypacker** did a fine job with the banquet and bar, the highlights of which were: **Jay Stratton** who, as after dinner speaker, gave us an interesting account of the purposes and problems of the Ford Foundation of which he is presently Chairman of the Board. . . . **Edwin H. Schmitz** as Master of Ceremonies gave a new 1968 version of "The Three Brass Balls" which delighted everyone. . . . **David W. Skinner** kept things moving and conducted a brief business meeting at which time **Forrest F. Lange**, your retiring Secretary-Treasurer, presented his report which was accepted unanimously. The highlights of this report were: the presentation on Alumni Day, 1966, of a gift to Dr. and Mrs. **Julius A. Stratton** on his retirement as President of M.I.T.; that registration fees just about balanced reunion expenses with a small surplus; and that this surplus, a surplus of new dues over class expenses, and interest on the previous class balance at 5½ per cent, resulted in a worthwhile surplus toward our 50th Reunion in 1973. Your Secretary-Treasurer succeeded in building the class financial dam, against unnecessary class expenditures, high enough to result in a little larger balance in the class account than was inherited in 1963. However, he apparently did not build it quite high enough; in late June a couple of packages arrived in the mail for him. Much to his surprise, the new officers had voted to send him a nice "gift from the M.I.T. Class of 1923 in grateful recognition of your service as Secretary the past five years and for all the hard work you did in making the 45th Reunion such a success." It was Polaroid's finest automatic Land Camera and case, and I take this first opportunity to thank the Class for

this fine gift. It has been a pleasure to serve as Class Secretary-Treasurer for five years. I hope that the *Technology Review* '23 news items have proved interesting, during the last 45 issues, and trust that all classmates will continue to send in news as frequently as possible to your new Secretary-Treasurer, **Tom Rounds**. Incidentally, I am preparing the news column for this October/November issue as Tom is away on a trip.

George A. Johnson's reception committee got everyone accounted for and "feathered down" comfortably without a hitch. **Horatio Bond** made the golfers happy. **Herbet Hayden, David Joy, Rodney Goetchius, Philip Coleman, Earle Griswold, Clarence Chamberlain, and Parker Holden** did a fine job on the program and sports committee; the cocktail hour and banquet were livened up by a very fine accordionist and Herb brought the same sailboat he had at the 40th Reunion and took several seaworthy souls for rides on the blue waters of the Atlantic. **Dave Skinner** and **Arthur Davenport** were seen out in the surf floundering around with the seals and porpoises. **Herb Hayden** and **Dave Joy** put on a most interesting kite flying contest. The shuffle boards, bridge, other games, and indoor pool provided relaxation for others. Relaxing in the sun and sand were also popular diversions, as were trips to Hyannis and other interesting parts of the Cape. After the banquet **Alan Allen** and **Royal Sterling** showed superb color films of the 35th and 40th Class Reunions, which Alan had carefully edited. Alan also did a fine job in taking pictures (movies) of everyone, both indoors, outside, on the terrace and on the beach. **David Kaufman** arranged an interesting drawing of prizes, donated by several classmates.

During the business meeting **Horatio Bond** presented the nominating committee's slate of new officers who were elected unanimously: **Howard F. Russell**, President, **George A. Johnson**, Vice President, and **Thomas E. Rounds**, Secretary-Treasurer. The following attended the 45th Reunion: **Esther G. and Forrest F. Lange**, **Dorothy and Horatio Bond**, **Alan R. Allen**, **Mildred F. and Howard F. Russell**, **Elinore E. and Rodney M. Goetchius**, **Bessie and Joseph Fleischer**, **Grace and A. Raymond Holden**, **Harriet and Bertrand A. McKittrick**, **Elsa and Winchester G. Blake**, **David Kaufman**, **Phyllis O. and Arthur W. Davenport**, **Mary Austin and John W. Beretta** and daughter, **Jackie**, **Katherine and Herbert L. Hayden**, **Muriel and David F. Joy**, **Stephen A. Days**, **Ethel L. and Elliot P. Knight**, **Elsie Alice and Walter Dietz**, **Esther and Earle A. Griswold**, **Alice and Thomas B. Drew**, **Marion and William S. LaLonde, Jr.**, **Winnie and Peter V. Martin**, **Vivian and Maynard L. Flickinger**, **Kim May Wen and Ping Yuan Tang** and their grandson **Martin** and granddaughter, **Nadine**, **Paul B. Brown**, **Margaret and Clarence F. Chamberlin**, **Elizabeth M. and Howard Lockhart**, **Virginia and Herman A.**



The purpose of America's private foundations, said Julius A. Stratton, '23, at his class reunion, is to assure "that

there remains open a multiplicity of paths to the achievement of our national goals." (Photo: O. D. Franken, '68)

Brunson, Catherine and **Julius A. Stratton**, Eleanor and **E. J. Healy**, Bertha M. and **Edwin A. Schmitz**, Nathaniel A. Frank, Ella and **Harry Green**, Florence and Roger Cutting, '24, Florence A. and **Archibald Williams**, Isabelle and **David W. Skinner**, Mary and **Charles R. Goldstein**, Eleanor and **Roscoe H. Smith**, Jean and **Gerald A. Fitzgerald**, Doris S. and **James A. Pennypacker**, Mary Duffus and **Norman L. Weiss**, Dorothy and **John W. Sands**, Alice and **Parker B. Holden**, Conchita and **Harold C. Pearson**, Erle and **Joel Y. Lund**, Mary and **Royal Sterling**, Anne and **Hyman F. Marshall**, Vivian and **Richard H. Frazier**, Mary Margaret and **Leander H. Poor**, **Philip L. Coleman**, Leah A. and **Edward S. Averell**, **Thomas E. Rounds**, Abbott L. Johnson, '22, **Arne Lier**, **Frederick O. A. Almquist**, Mary Lou and **Charles M. Mapes**, Helen and **John J. Murphy**, **Edmund H. Miller**, **George A. Johnson**, **Dorothy W. Weeks**, Mrs. Pauline Robinson, a guest, Ann and **Marvin Eicken-**

roht, Alice and **Howard L. Cobb**, Georgia C. and **Hugh S. Ferguson**, Ruth F. and **Frederick A. Kinch**, Pearl and **Isadore Robinson**, **Miles Pennybacker**.

Eduardo Icaza A. writes: "Thanks very much for your letter and that of Bondy regarding our 45th Anniversary. I made every effort to go and proceeded to make arrangements, but unfortunately my wife felt sick and had to have an operation. She is recuperating well, but naturally I did not go. Moreover, I came down with hepatitis. Two anecdotes to make a story: When a group of Tech men were returning from Christmas (1922) vacation, we took seats together on the train from New York to Boston. There were seven of us and so there was an empty seat. The train originated in Washington and came through New York and then on to Boston. (Perhaps **Alfred Perlman** got the idea from that ride of joining New York Central and Pennsy!) A white-haired

man came into the car and asked if he could sit in the empty seat and we, of course, said he could. He seemed to be very interested in our conversation about M.I.T., and just before we arrived in Boston it developed that he was **Samuel W. Stratton**, honorary member of the Class of 1923, who was just beginning his term as President of the Institute. In the course of the conversation he noted that 'we are all bachelors.' At the M.I.T. Fiesta which Cecil, Gay and I attended in Mexico City, a certain gentleman, who does not realize that M.I.T. Presidents are selected on merit and not on family relationships, asked Jay if S. W. Stratton was his father; and Jay merely answered, 'No, my father was married.' Please give my best regards to all the classmates." Eduardo, your letter was shown to Jay and others at the banquet.

Louis A. Metz writes: "I had been hoping up to the last minute that I could join all of you at our 45th Reunion but unfortunately circumstances beyond my control prevented my being on hand." But he said he would be thinking of the good fellowship we would be having and would appreciate my giving his regards to all. . . . **Miss R. M. Karapetoff Cobb** of Grozier Road, Cambridge, Mass. 02138, formerly technical advisor to the Lowe Paper Company, Ridgefield, N.J., has become the first woman to receive the 1968 T.A.P.P.I. Coating and Graphic Arts Division Award. The award is made for outstanding contributions to the industry or to the Technical Association of the Pulp and Paper Industry. At Miami Beach on May 14, she spoke in acceptance before a conference of the T.A.P.P.I. Coating and Graphic Arts Division and received a prolonged standing ovation at the end. Few women, if any, have received such high recognition of technical ability from a major organization in the pulp and paper manufacturing industry. In addition, Miss Cobb was the only woman in a group of nine T.A.P.P.I. members named recently for another outstanding honor, that of T.A.P.P.I. Fellow. Miss Cobb was responsible for many developments in the paper coating field during her 40 years at Lowe where she was director of research and development and later technical advisor. She is undoubtedly best-known for the Cobb size tester which she developed. It has been accepted and used around the world for years as the standard for measuring the water absorptiveness of sized paper and paperboard. Miss Cobb was married to the late Professor V. Karapetoff of the Department of electrical engineering at Cornell University. . . . **O.W. Lowry** writes that he had to pass up the 45th Reunion: "but I am definitely going to make the 50th, come what may."

Martin A. Burckes reports one child and two grandchildren (girl seven and boy six) and says: "Sorry I cannot attend. As Superintendent of the Kron-tona Institute of Theosophy I will not be free until sometime after July 1. Please give my regards to those who remember

me." . . . **Howard L. Cobb** reports two children and four grandchildren and an interest in minerals and ideas. . . .

Lyman L. Tremaine writes: "thanks very much for sending the Reunion literature as I requested but, alas, it was all in vain, because my kidney problem, while creating no urgency, is still acting up from time to time. Certainly hope to be on deck for the 50th." . . . **Clarence P. Thayer** writes: "Although I am unable to attend the 45th Reunion I felt I should at least write expressing my appreciation for the notices received. My wife underwent an eye operation in April and recently my son and his family were transferred to Germany. The past several years we have visited our son in California." . . . **Albert S. Redway** reported: "Sorry but I just could not make the 45th. Have gotten involved in a combination of circumstances that will require my being away. My best regards to everyone." . . . Lieutenant Colonel **Edwin M. Barnes** reports: "Practiced as a management consultant for many years, now retired and enjoying it. Have one son and four grandchildren. Sorry I could not make the 45th this year because of illness." . . . **Martin A. Burckes** reports: "Retired from U.S. Army September 1, 1952, Field Artillery Branch, but I was Adjutant General 88th Infantry Division from May, 1942, to August, 1946. Our sector was Italy, although we were in Africa for a few months—November, 1943, to February, 1944." . . . **Malcom L. Carey** writes: "Retired from Alcan in April, 1965, but am still spending about one third of my time as consultant for Alcan. Sorry I couldn't attend the 1968 Reunion but complications prevented it. Very best."

John P. Crabb reports: "Retired February, 1966, with four children (two married) and five grandchildren; Lieutenant John A. (B.S. University of Maryland) in Saigon and Miss Jean (Hood Graduate) is a teacher." . . . **Harold G. Crowley** reports: "Retired from Civil Aeronautics Board (U.S. Government) after 26 years as an airlines crash hearing officer following worldwide exploratory piloting from time of graduation in 1923 until start of employment with C.A.B. in 1939." . . . In May, 1968, President Howard W. Johnson announced the retirement of **Nathaniel A. Frank** as of the end of the last academic year. Professor Frank, who was Head of the Department of Physics from 1952 to 1962, has had an uninterrupted association with M.I.T. of nearly half a century. His particular areas of interest have been theoretical physics and metallic conduction. He made important contributions in radar theory and development at the M.I.T. Radiation Laboratory between 1941 and 1943, then went to Washington, D.C., as Expert Consultant in the Office of the Secretary of War. During the 1950's, Professor Frank was among those active with Professor Jerrold Zacharias in the development of the P.S.S.C. physics curricula for the nation's high schools. In recent years he has been associated

with the Education Research Center and is primarily concerned with restructuring and improving vocational, technical and occupation education in American schools. He is the author of two introductory texts in physics and co-author with Professor John Slater of *Introduction to Theoretical Physics*.

Robert L. Hershey, retired du Pont vice president, heads the Task Force on Chemistry and the U.S. Economy of the American Chemical Society's Committee on Chemistry and Public Affairs. The committee expects to complete its report in 18 to 24 months, placing particular emphasis on the role of people in chemistry and chemical engineering rather than on the amount of money involved or the number of industries affected. . . . **Olcott L. Hooper** writes: "Sorry I could not attend reunion." . . .

Hon Y. Hsu writes: "I have established my residence in Vancouver, B.C., Canada, since the end of January, 1968, but remain to be a Director of Jardine, Matheson and Company, Ltd., Hong Kong." . . . **David Kaufman** reports: "My daughter, Michele, is getting her Ph.D. in astronomy at Harvard." . . .

Luis R. de Luzuriaga reports: "Will the third generation also go to M.I.T.? I am registered Class of 1923. My son Eusebio, Class of 1952-IX, was recently appointed Vice President of General Telephone and Electronics Industries, Inc., for the Philippines. My grandson Luis (now 10) wants to follow in our footsteps. O.K., M.I.T.?" . . . **Percival S. Rice**, who has retired from Tufts, received the following commendation in a resolution of the Faculty of Arts & Sciences which states, in part: "In a period of rapid change in education, Cy's intimate and accurate knowledge of the undergraduate has been an invaluable bench mark and a necessary reference point in faculty discussion. His influence on our changes in direction, emphasis and procedure have always been quiet and subtle. He is a reasonable man, and he relies on reason better than many of us; he understands the relationship between cause and effect in the undergraduate. All of us will miss his companionship, his humor and his devotion to education and students. He carries away from Tufts our deep sense of gratitude and warm thanks for the valuable contributions he has made. We wish him health and happiness, and we look forward to his periodic returns to the campus. We hope to see him often."

Roy George Rinccliffe, Chairman of the Board, Philadelphia Electric Company, was honored on May 2 as the first recipient of the Philip A. Ward, Jr., Medal of the Franklin Institute. The award, established in 1965, is presented for significant contributions to industrial welfare and for achievements in the progress of industry. He was cited specifically for his part in the development of Philadelphia Electric's Peach Bottom Nuclear Powered Generating Station which was planned, developed and built during his administration. In part, the citation for the award reads: "Because of

his qualities of thinking and willingness to accept new and advanced ideas, R. George Rinccliffe has shown the way to dynamic progress in the new technology which utilizes nuclear power for the benefit of mankind." . . . **Tom Rounds** retired from his position of Vice President, Chief Engineer of the Borden Corporation of Danbury, Conn., in April, 1967. He is still active in the ball and roller bearing field, operating as a consulting engineer from his home in Danbury, Conn. Classmates can locate him, if visiting western Connecticut, at 25 Ridge Road. . . . **Edmund J. Thimme** of 376 North Fullerton Avenue, Upper Montclair, N.J., recently was promoted to Assistant to the Vice President in Charge of Electric Operation in the Electric Department of Public Service and Gas Company. He started with Public Service in 1923 as a cadet engineer and has been with the company ever since—in distribution engineering, as district and division superintendent, in industrial relations, and finally as General Manager of the Electric Department and General Manager—Operations before his recent promotion.

Garrison Brinton Thompson, after 23 years of service to Trinity College, Hartford, has retired with the designation Northam Professor of History Emeritus. Professor Thompson's career at the College has coincided with the presidencies of Keith Finston and Albert Jacobs. He was one of the teachers of the President-Elect, Ted Lockwood, and he has been in this period an important party to the uninterrupted progress of the College. Brinton Thompson brought to academic life the insights and experience of a long career in engineering and business. This involvement gave to his teaching a realism and wealth of anecdote that has chastened his theoretical knowledge. Several of his lectures in the survey course were classics of dramatic style; students who had been alerted to its special quality, for example, always looked forward to his famous lecture on the death of Abraham Lincoln. He is a member of numerous societies that reveal his deep roots in the American past—Sons of the Revolution, the Mayflower Society, Colonial Wars, and several others. To him, such affiliations fulfill a strong obligation to preserve, for the whole nation, the highest values of the formative years of this country. Besides his continuing research in American history, Professor Thompson will be as busy as ever in numerous church, civic, and club activities. He is a vestryman of St. Saviour's Church in Bar Harbor and a governor of the Bar Harbor Club. In Hartford he serves as a trustee of the Stone-Day Foundation. And, on the Trinity campus he will continue to be a familiar figure in the Library, at lunch, and in the History Department offices.

On May 24, 1968, Marjorie Sherman, Society Editor of the *Boston Globe*, wrote: "In an era of revolt and resistance, hippies and hysteria, it is

reassuring to say the least to walk for a while behind the plowlike wedge of wisdom, to share with three generations (and half a dozen college presidents) the academic assumption of a future. The Award of the Julius Adams Stratton Prize for Cultural Achievement, the more important because of what **Jay Stratton** meant to Boston as M.I.T.'s longtime brilliant headman, is history in itself. That it went last night to honor a man as keyed to the community as George Widney Thorn, authority in endocrinology, physician-in-chief at Peter Bent Brigham and Harvard Medical School teacher extraordinary, is an international step forward. The friends of Switzerland whose annual dinner touches off these happenings managed also to celebrate Jay Stratton's birthday; he and his beautiful Kay flew over from New York where he's chairman of the Ford Foundation, to attend and to bestow a Stratton Fellowship on Dr. Hars-Rudolf Durrenmatt of the University of Berne for studies in Musicology at New York University."

Nelson M. Fuller, 28 Montclair Avenue, Batavia, N.Y., who served as Batavia's Water and Sewer Superintendent for more than 10 years, died on May 1, 1968, at the Veteran's Hospital following a long illness. He headed the Department of Water and Sewers from June 1, 1948, until his resignation on April 14, 1959, when he became Executive Engineer with the Monroe County Water Authority, and he retired from the latter position some time ago. Earlier he had been head of the Olean, N.Y., Water Department for seven years and sanitary engineer for the Cattaraugus County Board of Health; and he served in the Navy in World War I. During his tenure in Batavia, water softening was one of the major accomplishments, involving an addition to the filtration plant. He also was responsible for establishing that an underground water supply existed in a "saucer" beneath the city which could be tapped as an alternate source to the Tonawanda River. Since that time, two wells have been drilled to augment the river source. Surviving in his immediate family are his wife, Bessie Grant Fuller, two daughters, a sister, and a stepson.

Setrag Sulahian, 11 Adams Court, Rockville Center, N.Y. 11570, died March 15, 1968. . . . **Charles W. Springer**, 2287 Oaksdale Drive, Highland, Ind. 46322, died June 4, 1968. . . . **Merrill W. Hammond**, Onset Lumber Company, Onset, Mass. 02558, died on March 4, 1968. . . . The following are changes of address: **Leslie W. Powers**, 11959 84th Avenue, North, Largo, Fla. 33540; **Aaron Harry Stern**, 530 V.F.W. Parkway, West Roxbury, Mass. 02192; **Russell W. Conant**, 2441 Janin Way, Soloang, Calif. 93463; **Atherton Thomas**, Hickory Hill, Dean Road, Stormville, N.Y. 12582; **Roland W. Frieder**, Fulton Green Corporation, 9 W. Washington St., Chicago, Ill. 60612; **Roger J. Evans**, 30 Farm Road, Trenton, N.J. 08608; **Frederick A. Kinch**, 8 Colt Road, Summit, N.J. 07901;

William Wofe, 18707 N.E. 14th Avenue North, Miami Beach, Fla. 33162; **Edward W. Smith**, Box 27, Milton, N.H.; **Luis R. de Luzieriaga**, Apartment 52, 226 W. 75th Street, New York, N.Y. 10023.

John E. Burchard, 564 Springs Road, Bedford, Mass. 01730; **Lyman L. Tremaine**, 630 3rd Avenue, New York, N.Y. 10017; **Richard P. Ovenshine**, 211 Jefferson Davis Highway, Apartment 504 S, Arlington, Va. 22202; **Floyd A. Tusler**, Press Club, 555 Post Street, San Francisco, Calif. 94102; **Philip H. Vivian**, Box 560, Franklin, N.C. 28734; **Wolcott A. Hokanson**, Box 674, Deerfield, N.H. 03077; **Robert Hill Kean**, Apartment 704, 4800 Fillmore Avenue, Alexandria, Va. 22311; **E. Fletcher Ingals**, River Road, Old Woodbridge House, Old Mystic, Conn. 06372; **Anna A. Mohring**, 441-16 35th Avenue, Flushing, N.Y. 11354; **Malcolm L. Carey**, 116 Northlake Avenue, St Lambert, Farcher, Canada; **Prentiss B. Alger**, 131 E. Cedar Street, Elizabethtown, Pa., 17022. . . . Should any classmate know the present address of the following, please notify your Secretary at once: **Asa K. Coffin**, **Everett L. Sweet**, **Charles A. Tirrell**, **William C. Hull, Jr.**, **Phillip H. Hardie**.—**Forrest F. Lange**, Secretary (protem), 1196 Woodbury Avenue, Portsmouth, N.H. 03801

24

Another summer gone, and since so few of you reported in, it is to be assumed that most of you spent it in such a leisurely way that you thought it had no news value. One of the highlights of your secretary's summer was a trip north with **Russ Ambach** and **Ray Lehrer** to make a personal survey of the Bald Peak Colony Club. It looks ideal for next June's Reunion. We had a personally conducted tour by Wally Gale, '29, a long-time member of the club, and we saw everything. You'll get details when we start the publicity this fall. (Maybe you already have it by now, since no time schedule has been set as these notes are being written.) We made the trip on a very hot day, but in Ray's air-conditioned car it was not a factor. Have you heard the latest in status symbols, the man who drives with his windows closed tight to make people think he has air-conditioning?

As usual, we have an impressive pile-up of news which has accumulated during the summer, so let's have a go at some of it and save a good bit for the barren days ahead. First of all, some more retirements. **Sargent Heath** made it January 31. He had been Vice President and Treasurer of the Washburn Company, in Worcester, Mass., for some years. **Willard Woodin Van Allen**, a classmate of your Secretary's at Exeter as well as M.I.T., left Eastman Kodak to its own devices on January 1, and immediately headed for the coast of Maine. He can be found now at any time of year on Ocean Point Road, East Boothbay, "far from pollution, (both air and water), noise, rat race, and riots." **Jack McCoy**



Samuel Shulits

says he's finding retirement "very enjoyable, with travel, gardening, and occasional golf." (Must make a note, the flower garden needs weeding again and something has to be done about the crab grass.) . . . **Gib Cowan** is certainly getting around since he cut loose. Last spring he and Nancy spent a month in La Paz and Baja, California. "Put in a lot of time hunting, fishing, and bathing, and found them all good." Next time you go to Old Sturbridge Village (for you non-natives that's the Massachusetts answer to Williamsburg) be sure to look up **Ed Moll**. He finally gave up the life of a glass and ceramics tycoon, sold his business and leased the property. For some years he had been a director of the Village, and now he's there five days a week. Don't know just what he does, but since one of the principal attractions is a group of people demonstrating early crafts, you'll probably find him blowing bottles or kicking a potter's wheel. . . . For years **Franklin O. Billings** was very involved with the subject of geriatrics, among other things how to keep the senior citizens productive. "Am leading the life of a retiree in a scenic and sparsely settled area of northeast Washington. (The postmark reads Newport, Wash.) Busy with various community affairs including attempts to get a new economic development under way. Not an easy task." Frank is evidently putting some of his ideas into practice.

On July 1, **Sam Shulits** became Professor Emeritus at Penn State where he headed the fluid mechanics program and the hydraulics laboratory. Sam has a long and impressive record in the field of sediment transport in rivers, river behavior, and open-channel hydraulics. He has made investigations of such famous rivers as the Wabash, Colorado, Santee, Susquehanna, and the Rhine. This fall he expects to be in Berlin where he has been invited to lecture at the Technische Universitat. Sam's son, Walter, is a brand new cadet at West Point, and he has a 10-year-old

daughter, Erica. "The advantage of marrying late in life, as I did, is that one has children at the age when most have grandchildren." . . . Remember that bit about the **Paul Cardinals'** car delivery service? Guess we'd better take back the suggestion you might want to hire them. There's some question of reliability. Let Paul tell it. "Lorene and I flew to Florida April 20; our friends whose Cadillac was AWOL for six weeks last fall (and their baggage and clothing and credit cards gone for good) took us to dinner. They flew back to New Jersey next day, and we had five lovely days of swimming in 82 degree water. Thursday afternoon I loaded the car with gas and \$106 worth of liquor at low Florida prices, then called Clint Conway in Clearwater. He confirmed they were expecting us for dinner next night, and further, that **Cy** and **Mary Duevel** were coming up Saturday and we were all going to dinner at Clint's club. We decided to go out for dinner before we packed the car with our stuff, including a wedding dress Lorene had bought for Carolyn's wedding June 29. Valet parking only, so I took the guy's stub after detaching the key to the trunk because of the liquor. Great dinner. Some dessert! The attendant said, 'Your Cadillac has been missing for half an hour.' Details would fill a book. I am now a consultant on car-stealing, too! Of course we never got to Clearwater, instead accumulated five more days of suntan waiting for the impossible. We finally flew home and have convinced our friends they'd do better leasing a car here in New Jersey for the summer, flying down and leasing another there for the winter. That Cadillac must be in South America by now. Oh yes, my home owner's insurance took care of the liquor and a trophy we were going to give Clint and Allora, minus the \$50 deductible, plus 111% of remainder." One welcome aftermath of the debacle: they met another classmate they hadn't expected to. "Clint did a nice thing. He phoned **Paul Miller** that we were in trouble. Paul drove 20 miles to the Fort Lauderdale police station and back, then dropped in at our apartment posing as a local detective! He and Helen took us to their swanky condominium, then to the Elks Club for dinner. Since I've volunteered for foreign duty with the International Executive Service Corps, I was glad to find them enthusiastic after the project he finished for them in El Salvador—helping a manufacturer of industrial gases establish a sales organization and advertising program. Also to hear that Clint has volunteered. By the way, before the theft we located **Walt** and **Marjorie Weeks** in a fantastic new condominium right on the beach in Delray." As you can see, Florida is becoming a '24 haven. But watch your car!

Sorry to have to report four deaths, with no further details than the dates. **Carl de Ganahl** died last March, **Henry R. Harris** in November, **Richard H. Russell** the day before Christmas, and **Edward M. Sheehy** in April, 1967. Our

class grows smaller.—**Henry B. Kane**, Secretary, Lincoln Road, Lincoln Center, Mass. 01773

25

Every member of the Class will be saddened to learn that on Saturday, August 3, 1968, **Avery H. Stanton** died. Ave was one of '25's most loyal and hard working class members. He served a term as Class President, he was active for several years as the Special Gifts Chairman for '25 in the Boston area and for many of our reunions has been a committee member carrying out his assignments with dispatch and pleasure. He has been of particular assistance to the Secretary over the years and will be greatly missed by all of us. . . . His great loyalty to M.I.T. was indicated by the many ways in which he has worked in the Alumni Association. He served on the Executive Committee 1953-1955, was on the Alumni Fund Board, 1956-1961 and served as its ninth Chairman, 1956-1957. For the past 20 years he has been a member of the Alumni Council. . . . In the town of Natick, Mass., where he had resided for the past 23 years, he was also active. For five years he was secretary of the Planning Board and served as a town meeting member for many years. For the past several years he had been carrying on consulting work, most recently had been associated with the firm of Hedge and Mattheis of Needham. . . . Funeral services were held at the Waterman Chapel in Wellesley, on August 6, at 11 a.m. Your Secretary would like to suggest that it would seem most fitting if Ave's friends would make special donations to the Alumni Fund in his memory. . . . Ave is survived by his wife, Frances, whom all of you will remember if you have attended reunions. Condolences from the Class have been sent to her.—**F. Leroy Foster**, Secretary, Room 4-144, M.I.T., Cambridge, Mass. 02139

26

This is the first time we have written you from Pigeon Cove in July but the *Review* Editors want to get the October/November issue out by mid-October. The activity here is a little different than we usually talk about. We have our little sailboat moored nearby in the cove (Pigeon Cove, of course). Our boat was originally designed by Nathaniel Herreshoff of the Class of 1870, the third graduating class from M.I.T. It was his designs that were the winning America's Cup defenders of the Sir Thomas Lipton era. As originally designed these little boats were called Herreshoff 12½'s because that is the waterline. They were gaff rigged, beautiful little keel boats and have been maintained these 50 to 60 years so that they still race at Marblehead and at Marion. About 20 years ago Cape Cod Shipbuilding acquired the design rights and started making them from fiberglass. They are now Marconi rigged and carry a genoa as well as a working

jib and a spinnaker for racing. Four people can sail in the spacious cockpit and three are really needed for racing when it blows. We have eight boats here, one of which belongs to Emily Wick, Ph.D.'51, Associate Dean of Student Affairs at the Institute. The boats are now called Bullseye's and we all love 'em for racing or just sailing around. . . . The other morning after getting on the automatic elevator at 140 Federal Street (Boston) I saw a man just miss it and pressed the "Door Open" button. He apparently thought I was the elevator operator and said, "24" and I pressed the "24" button dutifully. Then he squinted and looked more carefully and said, "I'm your classmate **Leon Task** from Miami." I got off at 16 and asked Leon to drop by if he had an opportunity, but apparently his schedule didn't permit it because I only saw him from 1 to 16 during which time he admitted that he reads the '26 Notes. Therefore, Leon, let me explain that I have not quite retired to running an elevator but I'll run one for you any day.

When a letter arrives from someone who has never written to the Class Notes before we tend to push it ahead of our loyal regular correspondents and here is one such letter from **W. H. Hoar**, a '26 civil engineer. "At the 40th reunion (my first), I met **Frank Strickland**, **Al Heyser**, **Bill Meehan**, and **George Leness**. Later in the fall I also saw **Marvin Pickett** on his return from Afghanistan. Al Heyser I see from time to time when I am in Washington. In the March issue you had news of **Bob Chidsey**, **Gilbert Caro-Delvaile** and **Cesar Canals**, whom I remember from classroom days. It is good to hear of them and of others I knew so long ago—but sad to read of retirements. My family is scattered. My wife died seven years ago and I have a son in Vermont, a daughter in Lebanon, another daughter nearby in Maryland and my younger son keeping bachelor's hall with me while he completes his studies. Happily most of the past four years have been spent in the tropics. I do not miss even the mild winters of Washington at all. After over 30 years railroading, I've spent the last eight with Transportation Consultants. I trust you survive the winter at Pigeon Cove and that—to quote an Englishman—'someday in August, at tea time, you may enjoy the felicity of a summer day.' Sincerely, **Bill Hoar**." Thanks Bill and while we are enjoying the felicity of a summer day right now—even in July—we honestly enjoy the wildness of winter here, too—January at cocktail time in front of the fireplace with arctic mist rising from the sea outside ain't bad.

Now and then your Class Secretary drops a note to key classmates who, over the years, have been fairly regular correspondents. The signal came a couple of weeks ago to write one such note, and before I got to it a letter arrived from David Meeker, '24, bringing the distressing news that his business associate and our classmate **Guy Frisbie** had died suddenly at Sea Island, Ga., while on a

trip with his family. Mr. Meeker enclosed a clipping from which we quote: "Mr. Frisbie, Vice Chairman of the Board of Directors and former President of The Hobart Manufacturing Company, joined the Hobart organization in 1926, following his graduation from M.I.T. With an early background in sales, he was elected Corporate Secretary in 1945; Vice President and Secretary in 1952; Vice President, Secretary and Treasurer in 1954; and became Vice President and General Manager in 1956. Elected to the Board of Directors in 1953, he was named Executive Vice President in 1959, and was elected President in 1963. He served as President until April 30, 1968, when he was elected Vice Chairman of the Board of Directors. His civic activities were extensive and include 16 years as a member of the Troy Board of Education; 26 years on the Board of Trustees of Stouder Memorial Hospital; the presidency of the Troy Rotary Club. He was a member of the Newcomen Society of North America, American Ordnance Association, and the national college fraternity of Sigma Chi. He is survived by his wife, Kathryn Menzie Frisbie, three daughters, Mrs. Stanley Martin, Dallas, Texas; Mrs. Bond Houser, 3d, Troy, Ohio; and Martha, Tucson, Ariz.; and seven grandchildren." . . . In addition to activities in his home town, Guy had served three five-year terms as an Honorary Secretary of the Educational Council of M.I.T. For the class, we extend sincere sympathy to Mrs. Frisbie and the Frisbie family. I always dislike ending Class Notes with a tone of sadness but can never convince myself to do anything but put it off until last. With these notes being published in the fall, I cannot say drop by during the summer even though writing in July. Also, it sounds ridiculous to say Happy Thanksgiving on July 7, but I do and please keep writing—letters from you are always "news" to the Class even though not published immediately. See you in December and Cheerio."—**George Warren Smith**, Secretary, Pigeon Cove, Mass.

27

The class secretaries get a slight respite in the summertime, but it was quite short this year, and here on a beautiful August evening the October notes need writing. There were two deaths reported over the summer. **William J. Heymans**, whom some of our classmates visited in Brussels, Belgium, died on May 3. His latest address was Avenue Helene 39, Berchem-Sainte-Agathe, Brussels. In 1957, Willy advised that he was Executive Vice-President of S.A. Sobemi in Brussels and that he had 12 children and two grandchildren. There are doubtless many more of the latter now. In 1963, word was received that he was Secretary and Treasurer of the M.I.T. Club of Belgium in which he always had a deep interest. . . . On March 3, 1967, **Natenis Kelly** died suddenly from a cerebral hemorrhage. It was his 63d birthday. "Count" came to Tech from Berkeley Preparatory School, entering Freshman year. He

received a degree in mechanical engineering.

Professor **Lloyd A. Bingham** has retired from the University of Colorado, where he spent the last 24 years of a forty-three-year teaching career. He came to M.I.T. from Northeastern for his senior year and received bachelor's and master's degrees in electrical engineering. He then taught at Northeastern, M.I.T., Nebraska and Colorado. Retirement will be at South Hero on Grand Isle, Vt. . . . I am indebted to **Ken Smith**, who is Dean of the Columbia University School of Architecture, for two news items: **James G. Vanderpool** has been made a fellow in the American Institute of Architects. He was executive director of the Landmarks Preservation Commission of New York. Most recently he has been in England as a member of the Advisory Board to the English National Trust. **Russ Westerhoff** was at the Columbia commencement, where his younger daughter finished her course in physical therapy at the College of Physicians and Surgeons. About himself, Ken writes: "The days, when people seemed to think the life of a teacher or an educator was a snap seem to be fast disappearing—not that it was ever true. So far I have not been kidnapped or incarcerated. Plenty of time. It is not all settled yet." . . . **George H. Jenkins** tells of having gone to England and South Wales with his sister last summer, visiting some 40 cousins, most of whom live in Sheffield, Yorkshire. George came to Boston from Sheffield with his parents in 1909. He taught school for 20 years and is now an electrical engineer in Boston. . . . **Bud Fisher**, whose M.I.T. activities are growing apace, spoke to the M.I.T. Club of Northern New Jersey on "The Middle East, an Area of Vital Importance to the Western World." Bud's background with Jersey Standard certainly qualifies him to speak on this subject. Bud and his wife were visitors in Mystic this summer and my wife and I were very happy to see something of them. . . . **Jim Chirurg** is now chairman of the board of Chirurg and Cairns, Inc.—advertising, marketing, public relations and publicity, with a long list of name-brand customers.

H. E. Franks Company of Waltham (**Harry Franks**, President) has announced a new concept for homogenizing the hot spots and blind spots of laser beam light, and a new concept for laser etching of micro circuits. The former is in production and the company is accepting orders for volume production of the latter. . . . **Phil Darling** says: "Still banging along and doing some consulting work (in Houston). **Bill Kaplan** was by and projected his 40th reunion slides accompanied by lots of narration, all very enjoyable. There were a few handsome brutes like **Casey Kazazian** and **Bill Richards** who strayed in among those old men. Am duping a bunch and then mailing to **Joe Melhado** for the class archives." . . . **Dick Hawkins'** name showed up in the '97 notes, son of Edgar M. Hawkins of that Class. . . .

National Fisherman magazine of May contained an interesting article about the phenomenal success of a synthetic potwarp developed by **Paul Woodbury** of our Class, who died two years ago. It is made of nylon and dacron waste material by the Rockport (Massachusetts) Twine and Rope Company. After a year in the water, samples showed remarkably little wear, and a market was immediately established by lobstermen and fishermen.

The flaps of envelopes in which contributions to the Institute are mailed have become a good source of messages for the notes. More than a dozen are on hand this month. **Laurence B. Cheney**—"Have found something better than working! Retired 9/30/67 from central engineering department of Uniroyal Inc., after 30 years service. Now teaching evening classes in adult education in hobbies of Early American decoration, caning and rushing chairs, and furniture refinishing. Son checked out as C-141 command pilot, daughter and grandchildren live nearby." . . . **Adelbert N. Billings**—"Still kicking around, leading a busy retired life. Some traveling and doing a bit of house refurbishing. Just finished a term as president of our local Allegany County Historical Society where my good wife and I hold offices and spend our spare time." . . . **Theodore Ordman**—"Still practicing patent law with Kenyon and Kenyon with whom I have been associated now for 31 years. Sorry to report that my wife has suffered two strokes in the past 3 years and is still taking therapy at the Institute of Rehabilitation Medicine in New York." . . . **Percy L. Richardson**—"I retired from the purchasing Department of duPont in December 1966." . . . **Robert Lee Petersen** writes from Puerto Rico that he retired from the Navy, and **Jim Snediker** also tells me that he's on the retired list and enjoying himself after many years of service with the long lines department of American Telephone and Telegraph Company. "We have been spending about one-third of the year in California, one-third at our cottage in Andover, N.H., and the rest of the time in Delaware." . . . **Morris Leonard**—"Still operating Leonard's Department Store in Dorchester. Hope to retire soon and travel."

E. Warren Ward—"Have been engaged in private practice since 1927, as consulting engineer for municipal water supply and water treatment. Vice President and Treasurer of Haley and Ward Inc., of Waltham." . . . **Randolph J. Petersen**—"Enjoying retirement." . . . **Charles W. Frank**—"Retired from Automatic Electric Company as of June, 1967, after 33 years of service." . . . **Edward Sanel**—"I am starting my third career as a construction engineer for the Leun Cather Company, 1522 K St. NW, Washington, D.C., on the Washington subway system. Plan to retire in 1987." . . . **Elmer Andrews**—"Retired from Eastman Kodak in April, 1967, after 40 years with Eastman Kodak Company. Will continue to live in Rochester but wife and I enjoy traveling; have visited Europe, Hawaii



*Dedication of the Ralph T. Jope shell.
Alumni crew (from bow, left in picture)*

*S. S. Richards, '64, L. V. Gallagher,
'54, P. W. Staecker, '64, G. J. Burrer, '54,*

*D. D. Buss, '63, W. H. McTigue, '54, K. D.
Stolzenbach, '66, Stroke, V. A. Skov,
'55, Coxswain, Peter Büttner, '61.*

and South America. Have two sons and five grandchildren." . . . **F. Sidney Badger**—"Am retired and doing metallurgical consulting work for Beckman Instruments Inc." . . . **Carl H. Anderson**—"Retirement life in Sun City, Arizona is welcome change from business and winters back East. My activities as a Director of the Home Owners Association and as Chairman of the Advance Gifts Committee for a new hospital defers concentration on improving my golf game." . . . **Charles H. Tedford**—"Hope to take a trip up M.I.T. way in the fall." . . . **Reginald F. Jacobs**—"Everything is going fine. Have retired as full colonel from Army Engineers (had 6 years in World War II). Still Chief Designer, with the Massachusetts Department of Public Works. Sorry to see so many classmates passing away." . . . Mail has been returned addressed to: **Henry W. Newell**, 803 Ridge Place, Falls Church, Va.; **Samuel Pearlman**, 60 Blake Road, Brookline; **Jennings B. Hamblen**, High Oaks, Artist

Drive, Nashville, Ind. Has anyone any word on these "missing persons"? We hate to lose track.—**Joseph S. Harris**, Secretary, Box 654, Masons Island, Mystic, Conn. 06355

28

If I had written a summary of our 40th Reunion a few days after Class Day, the emotional momentum resulting from those three marvelous days in Cambridge would have carried me through at least two pages of these class notes. However, today is August 12, a humid warm day in Lexington, and the exuberance of reunion has declined to the mellow glow of memories. Fortunately I have programs in front of me, letters and photographs, and all these combined with memory may result in a readable report. . . . First, let me assure everyone that our 40th Reunion was completely successful from all angles: attendance, gaiety, com-

panionship, food and drink, and accomplishments. From the last report 238 persons registered and this figure included wives and children who accompanied 122 classmates. There were several "bachelors." We had men from all corners of the country; and from Japan, **Shikao Ikehara**; from Rome, Mr. and Mrs. **Victor DeCorte**; from Venezuela, **Gabe Disario** and **Mariano Contreras**; from Canada, **Rene Simard**; and from other countries other people. And while on the subject, we had a good representation from California, Florida, Texas, Colorado, Michigan, Louisiana, and many other states, with the largest concentration from the middle Atlantic states and New England, as one might expect.

The Reunion got off with a bang with the uncorking of the bottles at our first cocktail party Friday evening in McCormick Hall, which proceeded as an informal reception for former faculty and

staff and President Howard Johnson and Mrs. Johnson. A buffet dinner followed. . . . Activities Saturday morning revolved around a bus tour of the campus and neighboring environs with a visit to the laboratories in the Compton building. Before lunch we had two talks in the Compton auditorium: "Air Travel of the Future" by Dr. Secor Browne, Associate Professor, Department of Aeronautics and Astronautics. The second talk was entitled "Pot, Acid and Speed" by Dr. Joseph B. Brenner, Psychiatrist, M.I.T. Medical Staff. . . . After these two talks, a brief business meeting was conducted by **Jack Chamberlain**, and the following officers were elected for the next five years: **James Donovan**, President and Treasurer; **Hermon Swartz**, Secretary; and **Charles Worthen**, Class Agent. This time the Class voted **Florence Joep** as an honorary member. . . . The afternoon was held open for sports, sightseeing, shopping and resting, and this brief period was followed by the **Bill Carlisle** cocktail party at the Stratton Student Center. Our Class Banquet and dance was held at the Student Center from seven to eleven thirty p.m. In between the songs and joviality we were privileged to see some new movies by Harold Edgerton. . . . On Sunday, after breakfast and religious services at the M.I.T. Chapel, buses left McCormick for a tour of Boston and to an exciting cocktail party and shore dinner at Anthony's Pier 4 on Boston Harbor.

Late that afternoon many members of the Class attended the dedication of the "Ralph T. Joep, '28," shell at the Tech boathouse. This event was of special interest to us, of course, because the boat was christened by Florence with 10 '28 oarsmen in attendance: **Jack Chamberlain**, **Robert Cook**, **Bill Erickson**, **Charles Hoyt**, **Paul Johnson**, **Ben Kelsey**, **Ernest Knight**, **Donald Perry**, **Ed Ure**, **Hyman Weinberg**. The Joep daughters and husbands were there with the Joep grandchildren. . . . Supper Sunday night consisted of an informal buffet, cabaret style, at Stratton Student Center, with all the free beer you could drink. This was followed by entertainment at Kresge Auditorium, and this was followed by deep sleep and partial rehabilitation, which prepared us all for Class Day, Monday, June 10. . . . After luncheon our overworked President and the Chairman of our 40th Reunion Class Gift proudly announced that our gift exceeded \$411,000. Not until that moment did we fully realize the tremendous amount of work that **Jim Donovan**, **Charlie Worthen**, and their committeemen performed to raise this impressive amount of money.

During the morning of Class Day a memorial service for M.I.T. alumni was held at the Chapel at 11:00 a.m. Our own **George Chatfield** took an active part in the services and read a eulogy. We hope to reprint excerpts in some future issue of these class notes. . . . Many classmates attended this 40th Reunion who had not attended previous reunions.

It was just wonderful to meet with these men again and to see how easy it was to recognize them after 40 years absence. Some had changed very little; others, of course, had lost a little hair and added a little weight. . . . It is with the deepest regret that we add two sad appendices to this brief report of the reunion: **Cole Armstrong**, who had made a reservation to attend, died suddenly on June 2 from a heart attack; and **Nord Milair** of Cortland, New York, died shortly after sending a check to **Jim Donovan** to add to our Class Gift. . . . At a luncheon meeting at Florence Joep's home on Friday, August 9, **Jim Donovan**, **Abe Woolf**, **Dick Rubin**, **Walter Smith**, **Charlie Worthen**, and your Secretary held a postmortem of the Reunion and at the urging of our class President laid the ground work for our 45th and 50th reunions. At least two or three of these men are certainly bears for punishment. . . . We also must report the demise of **James P. Mitchell** of Baltimore, Maryland, who died December 20, 1967; and **Wesleyan Watson**, who passed away September 2, 1966. . . . We have a long letter from **Max Parshall**, telling us of the years he spent with **Cole Armstrong** at the Colorado State University and at M.I.T. and we are saving this for a future issue of the notes. . . . For any omissions and errors of which we are guilty in recounting the days of our Reunion, please forgive us, because, as we've said once before, it's a hot humid day in Lexington this August 12.—**Hermon S. Swartz**, Construction Publishing Company, Inc., 27 Muzzey Street, Lexington, Mass. 02173

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Class Day, June 10, was rained out of the Great Court into Rockwell Cage but the Institute handled it in stride. Present from the Class of '29 were: **Bill Baumrucker**, **Arthur Bearse**, **Eric Bianchi**, **Paul** and **Mrs. Donahue**, **Ed Farmer**, **Bill** and **Mrs. Harris**, **Frank** and **Mrs. Mead**, **Mr.** and **Mrs. Newell Mitchell**, **Gordon** and **Mrs. Williams**, and **John** and **Mrs. Rich**. News: The Donahues' daughter, **Paula Frances**, who is attending Trinity College, was married the previous Saturday to **Stephen Scharfman**, law student at Georgetown Law Center in Washington. In the interim since last year, **Gordon Williams** had spent considerable time in Australia. **Bill Baumrucker** and his wife had been in Guadeloupe earlier, where they found excellent friends in the manager of British European Airways who is now stationed in Portugal. The **Wally Gales** could not be present as they were leaving the next day on a North Cape cruise. **Mrs. Ruth Dean** appeared as the first class great grandmother we have heard about. We learned that **John Wilson** and a crew of five or six are sailing his Danish-built boat, the "Hulgerdanske," to Bermuda, and the Azores, and thence to Spain—something we understand he has wanted to do for a long time. **Mr.** and **Mrs. Bill Harris** apparently had a lovely time at Sanibel

and Captiva, off Ft. Myers at the South Seas Plantation Hotel.

One June 10, a memorial service was held in the M.I.T. Chapel for alumni who were deceased this past year. Those from our class listed in the program were: **John W. Courter**, **Norman E. Earle**, **Edgar G. Gillon**, **Alfred Guenther**, **Fisher Hills**, **Jen C. Huang**, **John P. Kennedy, Jr.**, **John F. Lucey**, **Edward D. Martin**, and **Arthur J. Williams**. We are also saddened to hear of the death of **Charles A. Felker** of Toledo, Ohio. . . . Reunion Chairman **Bill Baumrucker** dropped us a note July 1, advising that **Fred** and **Betty Danner**, along with their daughter **Helen**, attended Donald (Bill's son) Baumrucker's wedding the Saturday before. Bill also included a list of people who have agreed to help him fortify his Fortieth committee, consisting of: **Lewis R. (Bill) Aldrich, Jr.**, of Billings, Mont.; **Malcolm M. Hubbard** of Newton, Mass. (who advises that he is doing consulting work); **Richard (Dick) Piez** of San Mateo, Calif. (who sends his best wishes to all); **Otto E. Wolff** of Lexington, Mass. (who is employed by the Polaroid Corp.); **Leonard C. Peskin** (who, as reported in April, is Senior Vice President of The Cosmodyne Corporation in Conshohocken, Pa.) of Wyncote, Pa.; as well as **Amasa (Mace) G. Smith**, Vice President of the Chicago Bridge and Iron Company in Birmingham, Ala., who has "every intention of attending the reunion and shall be looking forward to the occasion." . . . Also **Bill (W. Wirt) Young** (of Old Saybrook, Conn.); **Dan (Virgil W.) McDaniel** of Short Hills, N. J. who we understand, is now well recovered from the heart attack he suffered last March); **Hugh G. Hamilton**, who commutes between Durham, N.H. (May or June to November or December) and Boca Raton, Fla.; **Karnig S. Dinjian** of Rye Beach, N.H., who seems to have a lot in common with Hugh—Karnig's wife's name is **Helen**, also, and his winter address is in Florida, too, Fort Lauderdale; Professor **Herman P. Meissner** of Winchester, Mass. ("Let me know what you want me to do."); **Tom Speller** of Buffalo, N.Y. ("What is my first assignment?"); and **Sam Shaffer** of the May Company, Los Angeles, Calif. Our apologies to **Wes**, whose identity we dare not guess, who is also on Bill's list. And our thanks to all members of this 40th Reunion Committee.

We received a nice note from **Oscar Aros Vailla**, Paseo de la Primavera 127-A, Fracc. "La Florida," Naucalpan de Juarez, Edo. de Mexico, who advises that after retiring from Petroleos Mexicanos in October, 1966, he is now employed by Instituto Mexicano. Oscar sends his best wishes to all and says: "Here in Mexico City we do have the Olympic Games coming very soon; thus, if any '29er is planning to be here then, I will be pleased to meet him and his family." Gracias, amigo. . . . This summer we received many letters and news items about our classmates, for which we are most grateful. It is great starting off a new season of report-

ing with at least a small backlog of news available for the next deadline date. Many thanks. **John Rich**, P. O. Box 503, Nashua, N.H. 03060

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This year your Secretary's estival siesta was abruptly terminated by a notice concerning the *Review's* accelerated publication schedule which necessitates the preparation of Class Notes in mid-August, a time when, needless to say, enthusiasm for such a project tends to be at a low ebb. However, a brief report seems to be called for and fortunately a few items have accumulated. . . . **Leslie Ferrier** has been appointed Superintendent of the Municipal Electric Department of Mansfield, Mass. After graduation from M.I.T. he worked for Con Edison until 1947, with the exception of a World War II stint with the Army Corps of Engineers. Thereafter he worked for International G.E. and as chief electrical engineer for Creole Petroleum in Caracas. Since 1961, he has been a consultant to municipal electric operations. He and his wife live in Raynam. . . . **Arthur England** has been appointed Highway Director of Staff Services for the State of Connecticut. He went to work for the Connecticut Highway Department after graduation and has been involved in location, construction inspection, planning, programming and administration. He is a member of the Connecticut Society of Civil Engineers, the American Association of State Highway Officials, in which he represents the Connecticut Department on the Finance Committee, and an affiliate of the N.E. Section of the Institute of Traffic Engineers. Arthur lives in Manchester. . . . In an article on air pollution in *Chemical and Engineering News*, **Bob Armstrong**, who is senior Vice President of Celanese, is quoted on his company's program in this field. It appears that Celanese plans to spend \$2 million a year for the next five years on pollution control. On new facilities they allocate 5% of the total capital investment to such controls. In connection with their new acetaldehyde plant at Clear Lakes, Tex., they have gone so far as to construct a one-mile deep underground disposal well for the plant's chemical waste streams. . . . **John Rogers** has retired as superintendent of parts manufacture for the Kodak Apparatus Division of Eastman Kodak. His new address is given below. . . . In case any of you missed the announcement, **Greg Smith** has been elected a term member of the M.I.T. Corporation. . . . In the May issue of *American Paper Industry* there was an article by **Howie Gardner** on "Career Opportunities in Pulp and Paper Technology." As many of you know, for the past several years Howie has been at University of Washington where he is Professor of both Chemical Engineering and of Pulp and Paper Technology. . . . We have at hand a notice that a new yacht brokerage office has opened in Essex, Conn., under the name Northrop

and Johnson of Essex Inc., **Robert A. Poisson** owner. If any of you are looking for a yacht or perhaps even something more modest in the way of watercraft, I feel sure that Bob would be interested in talking with you about it. His telephone number is 203-767-0149. Good luck on your new enterprise, Bob. . . . Changes of address: **Robert T. Armstrong**, High Meadows, Box 112, Manchester Center, Vt. 05255; **Clinton F. Burns**, Apt. 407, 8315 Brook Lane, Bethesda, Md. 20014; **Charles G. Habley**, 3335 Clay Street, San Francisco, Calif. 94118; **William W. McDowell**, R.D. #2, Howleyton Road, Binghamton, N.Y. 13903; **William C. McLendon**, 2128 Fosgate Drive, Winter Park, Fla. 32789; **John H. Rogers**, 1509 S.E. 14th Drive, Deerfield Beach, Fla. 33441; **Norman J. Smith**, 12917 N.E. 31st Street, Bellevue, Wash. 98004. **Gordon K. Lister**, Secretary, 530 Fifth Avenue, New York, N.Y. 10036

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A few weeks ago, while checking in on a flight to Paris, I ran into **Leon Kolker**, who was on the way to London with his family. Leon remarried on January 6, 1968, to Betty Lee, whom I had the pleasure of meeting. Leon sold out his business (his third business if I recall correctly) in 1961 and retired . . . only to become interested in the United Nations Development Program. Since becoming interested in the U.N.D.P., he has built three plants in Egypt, in addition to working in Romania, India, Argentina, the Gambia and Pakistan. His son, Thomas, is now a Second Lieutenant in the Air Force and daughter, Ann, is a Senior at Jackson College. **Myrie (Perk) M. Perkins** wrote: "I have recently accepted an assignment from Bechtel International Limited which will take me to London. I plan to settle in the center of London, convenient to the Bechtel office. The move will entail a considerable amount of travel on the Continent. Fran and I are both looking forward to this exciting and new assignment. . . . My family grows apace. We now have three grandchildren, all in California. My son finished his academic work at Utah State University this June. He has specialized in conservation and is looking forward to work in this area. . . . Ed, I'm sorry we didn't get together more often while I was here in New York but I guess that's the way the ball bounces. Tell anyone who is coming to London to give me a ring." **Bill Mentzer**, Senior Vice President—Engineering and Maintenance for United Air Lines, has been elected to the National Academy of Engineering in Washington, D.C. Bill has been recognized in the aviation industry for his contributions in the area of new aircraft and he has been instrumental in the development of every type of aircraft United has operated since the early 1930's. **Eugene Macoy** writes that he is semi-retired after 35 years as physicist, electrical and electronics engineer for American Can Company and two years plus, in educational

television (producing, directing, and design and construction of studio and control room) for Darien Public School System but now very busily engaged as Theatre Consultant, largely in Fairfield County, Conn. Eugene's son, Norman, is a laser physicist with Perkin Elmer and daughter, Martha, attended the Connecticut College for Women in New London, Conn.

Received a short note from **Thomas T. (Themistocles) Pureka** saying he would like to hear from anyone who might remember him as he did not graduate and has lost contact with former classmates. I know Thomas would be delighted to hear from any of his old friends. **Bob Sanders**—Bywater Road, Annapolis, Md. 21401—writes that he is now President of Helicopter and Airplane Service Corporation, providing specialized helicopter service to T.V., Movie and News Media Industries, as well as a test bed for special electronic testing. He also does a routine maintenance and repair business at Gaithersburg, Md. . . . commuting by air from Annapolis. Word from **Alexander Kuhnel** advises me that at the first of the year he was transferred from Austin's Electronics Division in Roselle, N.J., where he was Director of Electronic Development, to the Technical Services Division at corporate headquarters in Cleveland as Staff Consultant for Systems Engineering. The Washington Award for 1968 was conferred on **Jim Fisk**, President of the Bell Telephone Laboratories, in ceremonies held in Chicago. The Washington Award represents "an honor conferred on an engineer by fellow engineers for accomplishments that preeminently promote the happiness, comfort and well being of humanity." In February, **Emilio Collado** discussed gold, the dollar, and international finance in the Richard J. Gonzalez Lecture at the University of Texas and later he testified before the Joint Economic Committee recommending that the U.S. adopt T.V.A. as a partial substitute for the corporate income tax.

Recent publicity releases tell of **Bob Wilson's** naming as a new Director of Alden Electronic & Impulse Recording Equipment Company. Bob is General Sales Manager for Sears Roebuck and Company in Eastern Massachusetts.

Other releases tell of **Elliot Whitaker's** nomination as a Fellow in the American Institute of Architects, of American Bilrite's expansion under **Dave Bernstein's** guidance and of the M.I.T. delegation to the summer conference at the Technical University of Berlin, headed by President Howard W. Johnson and our own **Gordon Brown**. It is with sorrow that I report receiving word of the deaths of the following classmates—**Richard S. Pollack** (May, 1965); **Arthur C. Seelye** (March 24, 1968); and my very close friend at Tech, Dr. **Harmon J. Truax**, who passed away on May 3, 1968.—**Edwin S. Worden**, Secretary, 35 Minute Man Hill, Westport, Conn. 06880



John F. Crowther, '32, new Projects Manager for the Chemtron Chemicals Division of Chemtron Corporation.



Edward Goodridge, Ellis Littman, and George Stoll, all of '33, (from left



to right). Foreground, Miss and Mrs. Littman. Dayton H. Clewell (above).

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The American Society for Testing and Materials has honored **Albert G. H. Dietz**, Professor of Building Engineering, Department of Architecture, M.I.T., by election to Honorary Membership in the A.S.T.M. The award is in recognition of his "outstanding and diverse contributions to knowledge of materials for building construction; for distinguished services in education, research, and professional engineering; and for long and faithful administrative and technical service to the Society." **Carroll L. Wilson**, Professor of Management in the Sloan School of Management, M.I.T., has made some optimistic statements about the inevitability of a collision on a global scale between population and food supplies. Professor Wilson is deeply concerned with worldwide development of food production and bases his optimism on such developments as two new species of dwarf wheat, developed by Mexico's Department of Agriculture and the Rockefeller Foundation, and new rice strains capable of reaching maturity in 120 days, opening the way for three annual crops instead of two. These technological advances lead to his predictions that critical areas such as India, Pakistan, and Turkey may become self-sufficient in one or two more growing seasons. **Erskine G. Roberts** has been appointed staff member of the Director's Office of the Argonne National Laboratory. He will assist the Director to plan, organize and direct the efforts of 350 scientists and engineers within the Idaho and Illinois organization. He is responsible for development of the Experimental Breeder Reactor II, the only primary fast flux irradiation facility currently operating in the U.S. He first came to Argonne in 1954 as area consultant in building major pilot and process plants and from 1963 to 1967 served atomic physicists in designing and building facilities for pioneer experi-

ments on the 12.5 BeV accelerator... **Thomas H. Jenkins** writes that it is nice to be back again in the States after living abroad for several years. He and **Jim Robson** are both in San Francisco with Bechtel Corporation and invite you to give them a call if you travel there. **Charles H. Taylor** has been appointed Superintendent of Schools of Nantucket, Mass., after completing the 1967 school year at Dover Sherborn Regional High School. His home address is 5 Copper Lane, Nantucket, Mass. 02554. Captain **F. Carlyle Roberts, Jr.**, writes of the passing away of his wife, Eleanor Cole Roberts, daughter of Sidney L. Cole, M.I.T., Class of 1905, on May 10, 1967. After 33 years of marriage he writes that he has passed the worst year of his life and the only direction now is up. **Eric P. Newman** has been named an Executive Vice President of Edison Brothers Stores, Inc., St. Louis, Mo. The firm operates 621 shoe stores, leased shoe departments and Joan Bari Bag and Gem Shops.

Lawrence F. Wagner, is Ocean (New Jersey) County Engineer. He reviewed new state traffic sign regulations at a public hearing in Trenton recently and pleaded for state agencies to approve municipal and county sign requests without delay. **Thomas W. Regan** was named chairman of the General Box Company, Des Plaines, Ill., a maker of industrial shipping containers.

Information has recently reached us of the death of **Herbert L. King, Jr.**, of 1158 Bradford Drive, Pt. Pleasant, N.J., on September 30, 1967, and of **H. Abbott Lawrence**, of 3940 S.W. Council Crest Drive, Portland, Ore., on December 20, 1967. We have also learned from alumni records of the death on February 13, 1964, of **Norman S. Sinness** of Old Hickory, Tenn.—**Elwood W. Schafer**, Secretary, Room 13-2145, M.I.T., Cambridge, Mass. 02139

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This starts off a brand new year, and, please note, a little early, to close the long gap between July and November. This is, or would be, ordinarily, a 35th Reunion column, but, most of the 35th news has already come out in the interim letter; a letter that reaches all classmates, and not just those who receive the *Review*. In the July issue, we carried short biographical sketches of some of our class officers, so now, we continue with that pleasurable job, and the title of the series is, "Know your Officers." With all but one listed in the July-August *Review*, we will not list them over again, but will just continue. Our handsome new Executive Veep is **Dayton H. Clewell**, a Senior Vice President of Mobil Oil Corporation, and President of Mobil Research and Development Corporation; since 1965, a member of the M.I.T. Corporation (we have three of ours on that Board); Dayt holds a doctor of physics (or is it a Ph.D. in physics?) from M.I.T.; successively, Dayt was with C.K. Williams of Easton, Pa., then went with the Magnolia Petroleum Corporation, a subsidiary of what is now Mobil Oil Corporation, and became Director of Laboratories of Mobil Oil in 1952; in 1956, he went to New York as General Manager of Mobil Research Department, and in 1962, he became General Manager of Research and Development Engineering; in February 1964, he was made Senior Vice President for Research and Engineering. Dayt's many Professional activities are indeed too many to try to list here, but do include a few of the more or better known societies, such as the New York Academy of Sciences, and Fellow of the Electrical and Electronic Engineers; and just as a bit of something for the other hand to do, he is President of the Darien (Conn.) Historical Society. Dayton Clewell, we all join in making for you a real salute: we are proud to know and be with you.



George Henning

The next one on the pile is **George Stoll**, and he claims that we are repeating ourselves. Maybe we are but we can still refresh our memories a little. George is still in wholesale Food Distribution, but I can't seem to catch him at work. But, I do know that he is practically retired and enjoys life "among the bogs" at East Pembroke. The Stolls have another grandchild, making three for their daughter in Maine. Son George Jr, is in Washington on hush hush work, and he, also, is married but has only one child, a son. We can safely thank George a whole million for the work he put in at the 35th. He was at the desk most of the time; my boy for sure! Thanks, George, for all of us. . . Next is Doctor **William D. Harper, Jr**, a brand new Vice President, Bill to you fellows; Bill is one of ours, Course IX, and then a Masters in Course II, Automotive, I presume.

After M.I.T., and I can't say how much after, he became a student at the Texas Chiropractic College, but soon after his degree as Doctor, he got caught up with World War II, and became Plant Manager for the Springfield, Mass. Machine and Foundry Company, builders of marine engines for the Maritime Commission. He stayed with that company until their contract was completed, and had earned the Navy E Award, then he left to return to Chiropractic work. He has served as Chairman of the Pathological Committee of the National Board of Chiropractic Examiners, and has been in charge of their Principles Committee. Bill is the author of what is recognized as a fine book entitled, *Anything Can Cause Anything*, and he quotes only the retail price of \$12.00, though I am sure that any of you fellows could easily talk him into a better price; anyway, good stuff, Bill. Two years ago, he became President of his (M.D.) Alma Mater, and I seem to recollect that the college moved its headquarters to the Galveston Bay area. He could not make the 35th, as his administrative affairs made it impos-

sible and this was tough on him. Just to keep busy, Bill and his good wife, Bobbie, are both Chiropractic Doctors and both are practicing their profession. Many thanks, Bill, and welcome to the fold as Veep.

George Henning now gets the floor, this time with a long biography, one that will need some editing. What a man! George has had but one business career, Belmont Smelting and Refining, a family concern, he joined in 1933; he became President in 1942, when his Dad, who was the founder passed on. It is not generally known that George has two brothers and a sister with him in the business. To quote just a little: "We have had our good and bad years, the first in the 1950's and the second in the 1960's, a real source of satisfaction to the guy responsible. Belmont has made it possible for us to live at standards of our own choice." He took a masters degree at Columbia School of Mines, and has also taken many self improvement courses. He was, until age 49, active in the Young President's Organization, but age got him out of that, so he joined the Chief Executives Forum, a more select group of limited membership. This group travels all over as part of their activities and George has visited San Juan, Mobile, Pebble Beach, Rome, and Colorado Springs. George is a Director of the East New York Savings Bank, and also of a few charitable agencies. And, last but not least, he is a Director of the M.I.T. Center of New York and a Fellow of this last organization, as I am, too. The family clubs are Nassau Country, Seawanhaka Corinthian Yacht Club, strictly a Golf Club, or so he says, Beaver Dam Skating Club, and the Liederkranz Club of New York. Through the lovely Lucy, George has become a real music lover, and does work at it. Besides all her music activities, Lucy has time to be the perennial Chairman of C. W. Post College of Long Island University Anniversary Ball. Folks, here is a really fine fellow, a gentleman, a pleasure to know, and with Lucy, heads up a family of three very active, and charming daughters. George, again, we love you.

Now comes **Beaumont H. Whitton** from the deep South, and how we enjoyed ol' Beau in June. Though born in Pennsylvania, Beau was educated in the Charlotte Public Schools; was a civil engineering student at Univ. of North Carolina at Chapel Hill, for two years, then went to M.I.T. and in 1933, took a degree in building construction (XVII, then). He joined the family business in 1933, becoming President in 1959. Beau and Daphne Amelia Clark were married in 1937, and this union has been blessed with three children; Margaret is a graduate of Agnes Scott College and has a masters from Brown; Robert Clark Whitton, Davidson College, 1966, and is now a graduate student at University of Pennsylvania; Mary Clark Whitton is now a student at Duke University at Durham, N.C. The Whittons

are very active in Church affairs, and Beau has been a member and officer of many professional and engineering clubs and societies. Beau also tries his hand at city planning, and is an outstanding member of the Chamber of Commerce, Charlotte. His clubs are the Charlotte City Club, Charlotte Country Club, and the Charlotte Rotary Club, and he has been a Director of all of them at one time or another. Just to be sure that time does not hang on him too loosely, he is active in Boy Scout work, and is a member of the Board of Visitors of Davidson College. Last and surely not least, the family business is the Southeastern Construction Company, doing business anywhere in the south. Beau reminds me of **Slick Henderson** (no family connection) as both are inclined to be just a bit earthy, or so they try to make it. Both are seemingly easy going, but don't let that fool you. Their personal bearing is similar, that's all. Many many thanks, Beau, and with the weddings out of the way, the lovely Daphne must surely make the 40th!

With details still to come from **Ellis Littmann**, and **Edward Goodridge**, I will pass on to the 35th. (I can't find their stories, and will have to ask for them again, if, indeed, I ever had them.) To begin with, the Reunion was a huge success. We have never had a nicer time with a nicer group of people. One hundred fifty-six people attended the Saturday evening dinner, which is the official meal held every five years. But most of these were with us Friday evening, also, which was and is something of a record. The cocktail lounge was a popular spot both evenings, and was deserted Sunday evening, except for a Harvard Group, Leona and I.

Friday evening was informal, with a few feet of 16 mm movies of the 5th and 25th reunions, and examination of the many snapshots of all other reunions on display. No one recognized all others, and one chap did not recognize himself (name on request). **Art Hayden** showed a group of slides, but I did not get to see them as we had another meeting in progress. Art, you are now the official custodian of all pictures, and I will see that you get them. I took pictures of over half of the classmates with some wives, myself. I will solicit pictures of all those present, for the record. Saturday, and Sunday were devoted to golf, and indoor sports, and Saturday was the dinner, awarding of prizes, and election of officers. President Goodridge opened the meeting with a few remarks, then made Bob Winters the Master of Ceremonies. Bob also had a few choice remarks to make: a real speaker. President Goodridge then asked for the report of the Nominating Committee, of which he was Chairman, and Warren Henderson presented this report. Right here, we must mention that the list of officers in the July Review was accurate, indeed, but one officer was not mentioned, as he had not been discussed until the Reunion; this officer holds a new post:

Class Marshall, and retiring President, Ed Goodridge was elected to this office. The job has no duties whatever, and it was our feeling that Ed sort of deserved just such a job, when one considers all that he has done for the Class at the many other reunions, and class affairs. To be really brutal about it, the job is Honorary, so there.

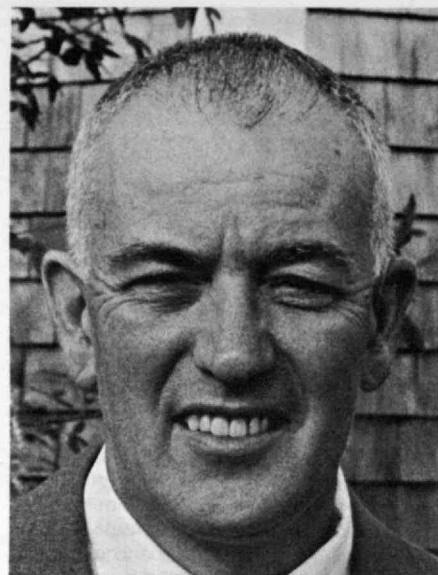
With the list of officers complete, we may well pass to another phase; I have been asked to make mention of the four Vice Presidents who voluntarily dropped out of the campaign, thus making room for the four new ones. As you may know, the Alumni Association asks every class to make changes every five years. Our last wholesale change was 15 years ago, so we had to do something. I am eternally grateful that only four volunteered to drop down, as I was two months finding their successors. So now, to **Dick Fossett, Charlie Bell, Dick Morse, and Duke Selig**, we thank you most sincerely for the fifteen years you gave us as Vice Presidents. We realize that there was, and is not much work connected with the job, but, your names on our lists was worth a lot to us. We appreciate you and thank you most publicly, right here. After the election, **Ellis Littmann** took over to award the various prizes for both men and ladies winners, at golf, putting, and bridge. A couple of non-winners also received gifts for some reason or other.

Leona and **Warren Henderson** were given small gifts, as were **Ed** and **Isabel Goodridge**. Ellis did a splendid job of Master of Ceremonies for Awards. He has been announced as Chairman of the 40th Reunion Gift Committee for the '33 Gift to the Institute. This is no sinecure, friends, as this gift campaign, which has already started, is the big one. We are expected to be generous at this time, as we have the precedent of all classes before us, and you may be sure that some handsome gift totals have been reached. Anyone want the figures? Ellis will have all of them. Ellis already is Class Estates Gifts Chairman, and merely adds this new honor to the other. The Institute appoints the Estates man, and the Class President, the 40th Gift Chairman. Though I have no direct information, our Class Agent, **Bob Swain**, has resigned, after all the write-up I gave the guy, and President **Jim Turner** has appointed **Robert H. White**, of Torrington, Conn., in his place. Anyone wanted to know the difference between these two jobs may write Bob White or Ellis Littmann. There is a difference, for sure.

As is only natural, our group on Alumni Day was the largest since 1958. I counted 31 classmates at either the Luncheon or dinner, or both, and most all had their wives with them. I will put the names of those folks in the interim letter and you will see them before you read this. We have covered 10 of our class officers and we now start on my good friend, Ellis. He was a course XV student at M.I.T. and went directly into

the family business after he got the word from the Institute. He was soon made President of his firm, The Nixdorf-Krein Manufacturing Corporation. The lucky chap married the charming little Roslyn, and a doll she is. The Littmanns have two children, a son now 26, married and living in Colorado, and a daughter, Susan, who attended the 35th with her parents; a lovely family. Ellis has been, and probably still is, active in Temple Israel of St. Louis; also in the affairs of the St. Louis M.I.T. Club, having been on the Board of Governors earlier. Further, Ellis is a very active man in Boy Scout work, though we have few details on this. I can admire such a chap easily. Ellis has been a Vice President of the Class of 1933, M.I.T., since 1953, and was recently re-elected. Last year, he was appointed Class Estates Agent by the M.I.T. Alumni Association. I can't forget, ever, last February when my TWA plane stopped over in St. Louis on a snowy, cold Sunday morning —4° above zero Fahrenheit—and who braves the elements to come out to see me? Our mutual friend, Ellis. Greater love hath no man, which almost literally applies here. It would be less than fair not to mention that old man **Slick Henderson** also made it. God love both of these kind gentlemen! Now, friends, you "Know your Class Officers," or should. I submit that we have as capable a group as ever, and we have always had good Officers, though some were silent men.

At long last we hear from **Edward Goodridge**, our immediate past president and our Class Marshall. Ed has asked us to be brief; why I don't know, yet! Between 1933 and 1939, we have nothing on or about Edward. But, in that year (1939), he and **Bill Gray** started Induction Heating Corporation that lasted well into the late 50's or early 60's, at which time the firm was sold. Many vicissitudes followed, but the sale is final now, or so it seems. In the long meantime, Ed started the Goodridge Engineering Corporation, headquarters in New York City; a flashy type of business which wound up as a consulting firm, if I can believe half of what I hear. In the Goodridge Engineering phase, Ed was located in New York City and was very active in the then new M.I.T. Center of New York, where he served on various committees, mostly Program. Later, Edward got just a bit nervous with too little activity on 42d St., so he started two corporations in Connecticut. One seems to be the family joy, The Electrostatics Corporation of Fairfield, Conn., quite near New Haven, or is it Bridgeport? Here Ed's old ingenuity came to the fore. The product is loosely described as a dry, electrostatic method of applying paint, or perhaps we should say, protective covering. Without any doubt Ed is off again, and will make it, for sure. Son, Bill, is with his father in the new firm, and will stay, no doubt. Bill is a graduate of North Carolina, June this year. Son Walter is in Japan as a Plant Manager, and, son Jimmy is at Washington and Lee. There, friends, is a capsule



Jim Turner

story of your new Class Marshall. Few have done as much for their Class as has Ed over so long a period, hence the new title. Good luck, Ed, and our sincere thanks for all that you have done in the past for all of us.

In conclusion, it seems only appropriate that we make mention of the splendid job done by the 35th Reunion Committee, led by our new President, **Jim Turner**. It is significant that Jim is now President, and **Fred Murphy** and **Clarence Westaway** are Vice Presidents. That is fast promotion for anyone. Fred and Westy were not alone, however. **Roger Congdon, Dick Warner, and George Stoll** all had a finger in the most successful Reunion we have ever had; this in the opinion of many. We have had a reservation for the 40th at Chatham Bars Inn, for better than three years, and our experience this time makes it rather certain that we will be going to Chatham again, unless something unforeseen happens. So to you men, like **Chuck MacMillan**, who wanted to attend but were prevented, we say, "better luck next time around." To those who ought to have attended but didn't, with no valid excuse, we say: "You were in no way foolish; just misguided." For the 40th, all these will be expected to attend. That would make about 140 plus the girls, which would be OK for any reunion.

We have a few address changes this time, perhaps more than usual: **Draveaux W. Bender, Robert Forbes, Newton W. Buerger, Eugene Cary, Dr. Gilbert W. King, Wolfgang M. Kloenne, James R. Merrill, Emerson Norris, Gordon C. Pratt, John W. Regan, Leighton R. Rickards, John D. Rumsey, Benjamin F. Sands, William L. Sheppard, Bernard E. Supowitz, and Captain Allen M. Zollars**. All of these addresses are available to any of you upon request. May we not hear from more of you?—**Warren J. Henderson**, Secretary, Fort Rock Farm, Drawer H, Exeter, N.H. 03833

Paul Wing, newly appointed Chairman of our '69 Reunion, has the following bulletin:

SUBJECT: Our 35th Reunion
WHEN: June 13-16
WHERE: Harborside Inn
Martha's Vineyard Island

Now is the time to make that important mental reservation to come to the best reunion ever at a newly discovered location. It will be the biggest turnout of all, according to the Classes of '48 and '63, who reached out to the historic whaling port of Edgartown this year. The Harborside Inn is an ideal setting for a perfect weekend. Your Reunion Chairman and his wife, Clare, report that the rooms are spacious and nicely furnished. The restaurant and other facilities at the Inn are excellent. There is golf nearby, swimming in ocean or pool, and a fleet of Boston Whalers and small sail boats for the more adventure-some. . . . The historic Vineyard named for Martha opens the summer season on this weekend and arrangements will be made for sightseeing tours of the island, its colorful homes, and unique antique and art exhibits. There is enough to see within walking distance of the Inn to make an interesting day. . . . It's easy and inexpensive to get there by boat or plane. An ABC travel guide will be forthcoming. Here's a chance for a little adventure in the good company of your classmates.

The committee is already shaping up and includes presently: **Les Doten, Norm Krim, Lou Frank, Larry Stein, Johnny Hawkins, Carl Wilson, Del Keily, Walt Wrigley**, and **Paul Wing, Jr.**, Chairman.

Congratulations go to **Walt McKay**, who was elected Professor of Aeronautics and Astronautics at the Institute in April of this year. **Dane Wells** is Vice President of Exeter House, Inc., manufacturers of upholstered furniture. He makes his home in Villanova, Pa. **Mrs. Clinton A. Hoar** (formerly Evelyn Killam) is "still working for Engineers, Inc." in Newark, N.J. Her 13th year. Her daughter graduated with honors last year from Colby College, Waterville, Maine and is now doing graduate work at Univ. of Washington in Seattle. Her son is doing duty for the U.S. at a base near Istanbul, Turkey. . . . **Ed Rickard**, Professor of Economics at Elmira College, discussed the gold crisis at a meeting in Elmira, N.Y. **Phil Kron** was recently elected Eighth District Vice President of the National Association of Purchasing Agents. A news release goes on to tell us that Phil and Ellie now have four grandchildren. He is Assistant Director of the Kodak Park Purchasing Division and: "has been active in the Rochester Chamber of Commerce; the Rochester Engineering Society, where he is treasurer and a director and has served as chairman of standards and publications committees. He is a director of the

Park Avenue Hospital and was treasurer and board member of the Greece Central School District; trustee and building committee chairman of Grace Baptist Church; and a district and council member for Boy Scouts of America."

Irv Kusnitz writes: "In January, 1967, I joined Stahl Finish Company, Inc., of Peabody, Mass. (a subsidiary of Beatrice Foods Inc.) as Corporate Engineer. Stahl, an international leather finish manufacturer, has plants in Holland, Spain, England and Canada, with others under way in the Western Hemisphere. "My duties are largely involved with planning, construction, and start-up of new facilities. My first major assignment was a plant expansion program in Montreal, which was started in December, 1967. Elder son, Paul, is a Dynamics Engineer with Lockheed in California. Younger son, Ralph, is expecting his B.A. from Harvard this June." **John Newbegin** is still with the Sheridan Company a Division of Harris—Intertype. **Bob Frazier** tells us: "Have retired as Civilian Engineer with the Corps of Engineers. Teach math at Gloucester High School on a substitute basis. Also serve as a Water Resources Consultant operating from a park bench overlooking Gloucester Harbor—a poor man's Bernard Baruch with limited scope." **Harry Fox**, in a note to **George Bull**, brings us up to date to the effect that he has been with the Office of Naval Research since 1955. He administers the Physical Chemistry Program for the Chemistry Branch of ONR.

Frank Milliken was elected a term member of the M.I.T. Corporation for the five years starting October 1968. He served as an alumni term member from 1962 to 1967. **Johnny Hrones** is an individual member of the Institute for Defense Analyses (IDA). A recent press release issued by the Trustees explains that a change is being made in the organizational structure: "Instead of the existing structure, consisting of institutional membership by universities, when the new arrangement takes effect, at least one-third of the members will be drawn from university faculties and staffs and at least one-third from the general public. . . . To assure the strength and continuity of IDA during this transition, the current representatives of universities have agreed to serve initially as individual members of IDA."—**Norman B. Krim**, Secretary, 15 Fox Lane, Newton Centre, Mass. 02159; **George G. Bull**, Assistant Secretary, Mid-Atlantic, 4961 Allan Road, Washington, D.C. 20016; **James Eder**, Secretary, 1 Lockwood Road, Riverside, Conn. 06878; **W. Olmstead Wright**, Secretary, 1003 Howard Street, Wheaton, Ill. 60187

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At a dinner meeting in mid-May at the Faculty Club, **Bob Forster** described to a group of classmates and wives plans for the 35th Reunion to be held

at the Chatham Bars Inn. Suggestions were solicited on the activities proposed and the amended agenda will be further circulated to the Reunion Committee. Those in attendance: Mr. and Mrs. **Prescott Smith, Allan Mowatt, Bob Forster, Al Marquardt, Irving Banquer, Ellis Flink, Howard Beck, Al Johnson, Nix Dangel, John Taplin, George Reece** and **Jerry Golden**.

Two interesting letters were received this month. The first from **Ed Taubman** reads as follows: "In February, of this year, my brother and I sold our retail business to a Washington, D.C. outfit, and are very gratefully out of the retail business. In fact, I like loafing so much I recommend it very highly, and think that people should retire as soon as they graduate from high school. I find that a college education is definitely not necessary to learn the art of being a Playboy. We will, however, probably continue in our real estate business that we started many years ago in order to provide locations for our retail stores as we find that to be rather lucrative—without the constant need for remaining on the job that a normal business requires. So far, I have taken a nice vacation during Easter with my children, and plan a three- or four-week motor trip to Nova Scotia this summer, and tentatively planning a Hawaiian Holiday near Christmas. For me to take three vacations in one year is more than I had in six years up to now. Of course, I do not know how long I will be happy in semi-retirement and, in a sense, it does seem a shame to waste whatever talents I had accumulated in all these years, but as of the moment that does not worry me too much.

My family is all well, and my oldest daughter was recently married and the other two youngsters are at an age that, now that I have the time, I am enjoying their company." . . . The second is from **Ellis Flink** and says: "My daughter Joanne, Simmons, '68, married Robert Silver, '66, who graduated from M.I.T. and who is now at Syracuse going for his Doctorate. My son James, '64, who is at M.I.T. going for his doctorate is going to marry Marci Witlin of Philadelphia August 31. Thus you see that we are having a busy summer all of which should raise my handicap." Co-Secretaries—**Phoenix N. Dangel**, 329 Park Street, West Roxbury, Mass. 02132; **Irving S. Banquer**, 20 Gordon Road, Waban, Mass. 02168

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At the time the alumni were sitting down for lunch in June on Alumni Day, your Secretary was sitting down for dinner over 8,000 miles away in Erzincan in eastern Anatolia. Who attended is still a mystery to me but I will report when I find out. My youngest daughter, Martha, and I had gone to Turkey to visit my oldest daughter, Prudence, and her husband, David Phillips. We were fortunate to be able to accompany

them on a fascinating eight-day motor trip starting from Ankara where they have been living for the past two years. . . . **John Bete** writes that in addition to the Bete Fog Nozzle, Inc., in Greenfield, Mass., he now operates the Bete Manufacturing Company in Marion, Mass., manufacturing marine hardware. He puts his own products to use, I am sure, on his 35 foot ketch. . . . From **Henry McGrath** comes the news that for the last few years he has been Vice President of the Canadian Kellogg Company, Ltd. He has been with M.W. Kellogg Company since leaving graduate school at M.I.T. His older daughter, a Smith graduate, has been doing graduate work at Columbia and a younger daughter is a student at Smith. . . . **Walter Seinsheimer** writes that he is now spending full time as an arbitrator for Labor-Management Disputes and for Commercial Arbitration. . . . **Leonard Cohen**, a Staff Engineer with Lockheed Missiles and Space Company, has been lecturing at San Jose State College in mechanical engineering. . . . In Madison, Wisconsin, where summer meetings of six mathematical organizations were held, Professor **Donald C. Spencer** of Stanford University presented a set of four colloquium lectures. . . . Philip Gillinson, 3d, a '66 graduate of Clarkson, is following in his father's footsteps and has joined the staff of the M.I.T. Instrumentation Laboratory. . . . A recent issue of *Chemical Engineering* carried a paper on pipe tracing and insulation by **Frederick House**, a Project Manager for the Badger Company in Cambridge. . . . **George Parkhurst** writes of a very interesting change of affiliation from the International Equipment Company to the Massachusetts General Hospital where he is setting up blood donor programs in business firms and various organizations. The program is being carried out in close co-operation with the Red Cross so that donors will receive the usual credits toward blood which may be needed at a later date by them or members of their immediate families. This is an entirely new program at Mass. General Hospital and George feels it offers an exciting challenge in a humanitarian field. . . . I regret to report the deaths of three members of the Class: **Joseph Fratus** in January, 1968; **Joseph Lukesh** on February 16, 1968; and **Frank Chiminiello** on June 12th last. . . . **Alice H. Kimball**, Secretary, 20 Everett Avenue, Winchester, Mass. 01890

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I am a voice crying in the wilderness. The Class of 1938's 30th reunion was very successfully held at the Chatham Bars Inn on June 8 and 9. Some 100 of us emerged; the weatherman gave us the most delightful weather that can be imagined. Oddly enough, the Harvard Class of 1938 moved into the Chatham Bars Inn on Sunday afternoon as we were leaving, and then the rains came. . . . The five-year railroad election went on as is customary. Your new President

is **Bob Johnson**, Vice President is **Norm Leventhal**. The only man we could successfully trust with money over any period of time is our perennial Treasurer, **Ed True**. **Fred Kolb** was successful in dumping the secretary's job on me. . . . Since the Class Secretary is only as good as the news he gets, if each one of you will conduct his own PR campaign, I won't have any trouble representing the Class well during the next five years. Your co-operation will be most helpful. . . . **Jack Chapin** appeared at the reunion in his camper. **Harold Strauss** came in from the West Coast, taking the record for the most distant class member. . . . About a third of those attending the reunion continued up for Alumni Day. The most memorable sight to be seen on that august occasion was **Don Severance** on the stage making like a dummy. Many of us have had our suspicions over the years but never before have we had visible proof. . . . Your Secretary was down in Chatham, N. J., last month to witness the wedding of **Ed Hadley's** eldest daughter, not, unfortunately, to an M.I.T. alumnus. . . . **Giff Griffin**, who was at the reunion, has moved up in Public Service Electric in New Jersey to General Superintendent of Generation. We assume this refers to electricity.

Appended below are a few tidbits culled from reunion applications: **Kenneth M. Gunkel**—"Have recently left W. R. Grace & Company and established my own engineering consulting firm called Pan American Industrial Consultants, Inc., 322 Main Street, Stamford, Conn. 06901, specializing in plant design and construction for Latin American industries in the pulp, paper, sugar, and power fields." **Marvin M. Kahn**—"I always had fond memories of the Boston area, and was happy to return in September, 1964, to take my present position as Development Manager—special projects, with the Boston Woven Hose Division of the American Biltrite Rubber Company in Cambridge. My work is more concentrated in specific areas as against my former company affiliation where I was Vice President and Director of Research and Development in Trenton, N. J. I am presently engaged in the fascinating field of indoor-outdoor synthetic surfaces for athletic fields and recreational areas. Two years ago, we bought a lovely home in Newton, Mass., with lots of lawn. I take care of the lawn myself with an assist from my son, Brian. Brian is a junior at Newton South High. My wife Shirl is presently teaching in the Boston Public School system." **Bernard S. Lement**—"I have left ManLabs, Inc. after 10 years as project director on Research and Development. I am now a private consultant on Materials, Processes and Products in Waltham, Mass." **Howard E. Milius**—"Grandson in Byfield, Mass. Granddaughter in Pittsburgh, Pa. Son at Rutgers Graduate School for MBA. Still at Millmaster Onyx Corporation, now on American Stock Exchange in Corp. Comm. Dev. & Planning—chemical and allied businesses."

Eric Reissner—"We found Chatham so

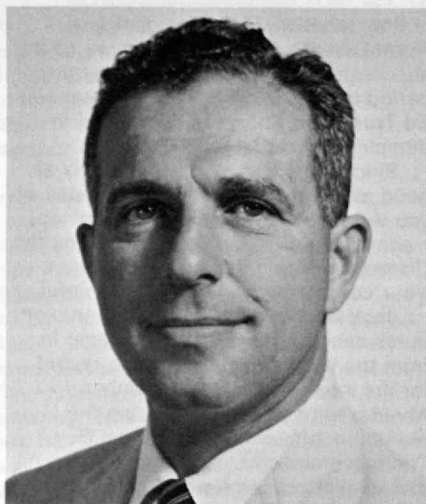
appealing at the '58 reunion that we ended up owning a small place nearby. It's 1 3/4 hours commuting with today's roads but we still don't manage to spend as much time there as we thought we might, partly on account of superior golfing facilities right next door at home. Our children are no longer at home, son in San Diego, Calif., aspiring to Ph.D. in physical chemistry. Daughter married (to Swarthmore classmate, grandson of M.I.T. people). Both grad. students at M.I.T., he in radio astronomy, she in "Ecc" (she should have handed in her M.S. thesis by the time this reaches you). We both are in good health, continuing work and civic activities, respectively, with as much enthusiasm as in the past (except maybe that we get a bit more philosophical when something comes out a shade less well than hoped for.)" **Walter Kaufman**—"Ruth and I are still happy and active in Sunbury, Pa., area. Have just added a new wire mill to our Paulson-Webber plant here, where I'm V.P. Our older daughter Meg graduated from Susquehanna U. in 1966 and has been working for his master's at U. of Chicago. Younger daughter happily married in 1965 (Mrs. Stephen J. Dagle), and we're proud grandparents of 2-year-old buster named Jonathan." **Robert H. Park**—"My plans have gone awry. Finally after fighting back trouble for 20 years, I had an attack that I couldn't shake off requiring a major operation for a ruptured disc on April 25. I'm optimistic about the results but the recovery will be very slow. Consequently, much as I have been looking forward to attending the reunion, it appears that I will probably have to miss it. Please give my regards to all the more spry members of '38."—**Armand L. Bruneau, Jr.**, 550 Broad Street, Newark, N. J. 07102

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Emeritus Professor of Railway Engineering John B. Babcock, '10, sent along this first item, from the Boston *Herald Traveler* of July 31: **Joseph George Zeitlin**, I, currently Dean of Civil Engineering at the Israel Institute of Technology, Technion City, Haifa, Israel, was featured in a four-column write-up about his activities in soil engineering. Joe began work in Israel on an U.N. mission in 1953, remained to accept the post of Professor of Soil Engineering at I.I.T., is currently serving also as Dean of Faculty of Civil Engineering, and maintains his own consulting practice concurrently. Many thanks to Professor Babcock for this clipping, and also for the reminder that his son, Bill, (also Course I) still serves as Administrator of Highways for the State of North Carolina, at Raleigh. . . . Another sharp-eyed correspondent, **Martin S. Lindenberg**, VI, of 244 Carroll Street, New Bedford, Mass. 02740 (head of his own firm, Kalco Weaving Corporation, of New Bedford) sent along a *Wall Street Journal* clipping about **Eli M. Dannenberg**, X, as having been elected Vice President of Cabot Corporation, Boston. Martin and Mary are still maintaining

their same activities and are in good health. They hope to see all of us at the reunion—which is not so far away now. . . . Several short items gleaned from Alumni Fund return envelopes: **Francisco J. Morales, I**, is President of Framorco SA, engineers and contractors. He is also Technical Advisor (Ad-honorem) to Panama's Ministry of Foreign Affairs, on matters relating to the proposed Isthmian Sea Level Canal Studies. He said that the "Morales Plan" for the conversion of the present canal to a sea level canal is one of the projects under consideration by the Atlantic-Pacific InterOceanic Canal Commission. **Wesley A. Kuhrt, XVI**, is now Executive Vice President of Sikorsky Aircraft, in Stratford, Conn. **William R. Willard, XVII**, wrote that he was elected President of the Old Saybrook Chamber of Commerce, and that he is also a Director and member of the Finance Committee of the Essex Savings Bank, Essex, Conn. **David G. Kaufman, VII**, until recently Technical Director for the Davis and Geck Division of American Cyanamid, in Danbury, Conn., moved in June to be Laboratory Director for the Department of Surgery, Maimonides Medical Center, in Brooklyn, N.Y. **Simon M. Roberts, IX-B**, wrote that he now has two sons at Harvard, Carl, '70, and Michael, '72. Mike graduated from Browne and Nichols School in Cambridge in June, receiving an honorary Freshman scholarship. **George D. Cremer, IX-B**, Chief of the Manufacturing Department of Solar Division of International Harvester Company, San Diego, is the proud possessor of three grandsons. **Wiley Corl, VI**, indicated that he "was recently elected Exalted Ruler of Norristown Lodge #714 of Benevolent and Protective Order of Elks." Wiley's new address is: Apartment 6J, Hampton House, Penn Valley, Narberth, Pa. 19072

Walter F. Johnson, XIX, a candid classmate indeed, wrote that he is almost halfway in raising a family of eight children, ages 28 to eight. (Walter: Just how do you define "halfway"? Perhaps you'll elaborate on that interesting point, come reunion time!) He recently acquired the title of "Manager of Technical Services for National Steel, Pittsburgh, which means applying computers to solve technical problems and process control. **John A. Dodge, XVI**, recently left AVCO Space Systems Division to join General Electric Re-entry Systems Department as Manager of Interplanetary Programs. **John F. Stiff, V**, wrote that his oldest daughter Janice is married and is teaching Junior High math in La Grange Park, Ill. Son Jack, Jr., is finishing Sophomore year at Hobart College, and daughter Judy is in high school. For John's fourth news item, the "old man (me) is still with Columbian Carbon Company as Regional Sales Manager of Northeast U.S. and struggling to pay off mortgage and college bills." For the final item of this welcome batch of first-hand news items, **J. Ellison Hawkes, XVI**, is still at Lockheed California Company as Chief AH-56 Engineer, the new Army attack



Eli M. Dannenberg, '39

helicopter. . . . Distilled from recent news clippings, **Richard D. Martin, X**, Senior Engineer of Polaroid, has been named Finance Committee Chairman of the Marblehead Town Government, following his ninth year of service on that committee. **Charles B. Pear, VI**, Staff Scientist of Potter Instrument Company, Inc., Plainview, N.Y., edited *Magnetic Recording in Science and Industry*, a twelve-chapter book published this summer by Rheinhold. **John T. Massengale** has been appointed Research and Development Manager for the Film Operations of American Viscose Division, FMC Corporation, Philadelphia. **John N. Hobstetter, X**, has been appointed Vice Provost for Research, at the University of Pennsylvania, Philadelphia. And for the final news item, **Howard K. Schachman, X**, is serving as Professor of Biochemistry and Molecular Biology at the University of California, Berkeley. . . . Two deaths to report: **Bernard B. Langton, XI**, of Boxford, Mass., on July 30, 1968, and **Walter G. Thomas, X-A**, of Largo, Fla. No further details available. . . . To close this column for this month, be sure to mark down June, 1969, for our 30th reunion. Details will follow here and by mail during the next few months. —**Oswald Stewart**, Secretary, 3395 Green Meadow Circle, Bethlehem, Pa. 18017

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After staying in the United States all of his life with only an occasional trip to Canada, your Secretary unexpectedly went behind the Iron Curtain briefly during May. As a result of work for a new client it was necessary to visit Prague, Czechoslovakia, in regard to a new hydrophilic polymer developed there. The first area of use of the polymer appears to be in the mass production of contact lenses. Prague was a fascinating city and I hope to return some day when there is more time for sightseeing. The Czechs were very pro United States which is surprising since

we have done nothing to help Czechoslovakia in many years. My trip coincided with the initial Czech-Russian crisis, but there was little evidence of it in Prague. The Czechoslovakian government is making a sincere effort to liberalize conditions.

It is with regret I must report the death of **John F. Martin, VI-C**. John resided in Mendham, N.J. As reported in our 25th Reunion Book, John worked for a brief period with Central Hudson Gas and Electric Company in Poughkeepsie, N.Y. as an electrical engineer while teaching a radio repair course at night. He married in early 1941, and shortly thereafter was called to active duty and attached to the Air Force. After active duty he went to work with the Bell Telephone Laboratories at Whippany, N. J. as a member of its technical staff, working on the development of guided missile systems and communications systems. As a result of four years of teaching courses in microwave theory and radar system design, John was convinced that he could do with more education himself, so he enrolled at Stevens Institute of Technology in 1957 and received an M.S. degree in 1959. As his interests became somewhat more generalized, he enrolled in a program of mathematical studies and in 1964 quit Bell Laboratories to concentrate on his research and doctor's dissertation. He received his Ph.D. in mathematics in June, 1965. No details are available of John's activities since 1965. . . . It is also with deep regret that I must note the death of **F. Alexander Magoun, '18**, who many will remember as Professor of Humanities. Alexander was a personal friend and confidant for 30 years and took time out from a busy schedule to help your Secretary when he had some serious problems several years after graduation. Those who knew him may wish to contribute to the scholarship fund established at Franklin Pierce College, Rindge, N.H., where he was head of the Social Science Department. Your Secretary has contributed to that fund and in a modest way has started a scholarship fund in Alexander's memory at Tech. Any classmates who wish to add to the fund should send their contributions to Tech. I would suggest sending them to **Phil Stoddard, XV**, who is Vice President for Operations and Personnel.

From **Norm Klivans, X**, the following: "A few notes to keep you and the Class informed. Presently I hold down the position of Vice President, Clevite Corporation, here in Cleveland, Ohio, and am the group executive for three electronic product divisions. Clevite is a diversified manufacturing company in electronic equipment and components, automotive parts, and power source devices. I've been with Clevite since 1951. . . . My older son, Norman, Jr., is now going into his Junior year at Yale; Charlie, the younger one, into his Senior year in High School. . . . We live a rather quiet life in a suburb of Cleveland. See some Tech men once

in a while. Dick Price, '50, works at Brush Instruments Division, **Hurley Bloom** had dinner with us several weeks back, run into **Robert Davis** when in New York, and Bob Armitage, '58, is on our Corporate Staff."

The Alumni Fund responses include a few personal notes from classmates. **Bill Steber**, VI, is Chief Engineer, Missile Division, North American Rockwell Corporation, 4300 Fifth Avenue, Columbus, Ohio; **Clement Burnap**, XIII, notes: "It appears that the vicissitudes of the defense industry have fully caught up with me, a 10-year executive with North American Rockwell, and I shall be looking for a new career shortly. It's true, however, that I put together the 18 years in shipbuilding, chemical plants, and heavy machinery with advanced technology. Anyone needing a market development from idea to distributive system let me know." . . . Major General **Bob Seedlock**, S.M., I, pens: "Had lunch recently with General and Mrs. W. E. R. Covell ('23). He is former director of M.I.T. Corporation, Alumni of Graduate School, and former partner of Parsons, Binckerhoff, Quade and Douglas. He was my first C.O. in Pittsburgh Eng. District in 1937." **Bill Singleton**, IV-B, was elected President of the Gulf Southwest Chapter of American Institute of Planners in December, 1967. Bill resides at 3337 Convention Street, Baton Rouge 6, La. From Admiral **Alfred Ward**, VI, S.M.: "I am retiring from the Navy in July and moving to Mobile, Ala. The four Naval Officers (then Lieutenants), granted master's degrees in 1940, are all Admirals; **Rivero, Hooper, Mustin and Ward**." . . . **Charles DeMaily**, XV, states: "Still at the same old stand but as one of the 'new breed'—presidents of companies taken over in the tidal wave of mergers and acquisitions. It's always Alumni Open House at our splendid new headquarters dedicated a year ago in New Bedford's Industrial Park—close to home, beach, and boats in my beloved Buzzard's Bay."

Amos Shaler, VIII, notes that he is President of Amos J. Shaler, Inc., a consultant firm specializing in designing, setting up, evaluating, and participating in R and D programs for clients whose goal is innovation in materials systems and processes of making them for a variety of objectives. Amos has continued to live in State College, Pa., since he left the Pennsylvania State University, where he was Head of the Department of Metallurgy until he went into full-time consulting in 1960. Daughter Louise will be graduated from Penn. State U. this year; Cynthia is finishing her Freshman year at Vassar, and son James, '14, at State College H.S., promises to be M.I.T. material soon. . . . **Clark Goodman**, VIII, Ph.D., has recently taken on additional government assignments, member Licensing and Regulations Parol-A.E.C. Member Lunar and Planetary Missions Board-N.A.S.A.; Chairman Committee on Radioactive Waste Disposal-N.A.S.A.



Norman R. Klivans, '40

John Rittenhouse, S.M., X-A, died on February 19, 1968, while undergoing a second operation for a brain tumor after an illness of two or three months. We are indebted to Paul Shepherd, '53, for the following item from the M.I.T. Alumni Association of the Bay Area (San Francisco): "John Rittenhouse was a very conscientious man—he never failed to do a job that he agreed to take under his wing. Even after he was President of the M.I.T. Alumni Association of the Bay Area, he continued to accept and do jobs for the new President, Roy Greatwood, '24. . . . He was dedicated to M.I.T. . . . It was under his administration that we had the first meeting I can remember in company facilities, the Crown Zellerbach Building; we visited the building and then after dinner listened to a talk by the Dean of Architecture from M.I.T. Meetings and tours of the Kaiser Building and the United Maintenance Base followed. . . . John helped to get the Freshman Round-up launched which has since become an annual tradition. This was another job that John fostered after he became ex-President. . . . He was a friendly man and all of us who worked with John valued his friendship. In the future, we will all miss John Rittenhouse greatly. . . . Let us stand for a minute of silence in honor of John Rittenhouse." . . . John was born in Williams, Ariz., on September 19, 1916, and received a B.S. in chemistry from the University of Arizona. He worked for Union Oil at the Wilmington and Oleum Refineries from March, 1940, to September, 1942. For the next 2½ years he was with Bechtel-McCone-Parsons, Los Angeles. After a month on loan to Standard Oil Company of Alaska, John returned to Bechtel in April, 1945, and remained until May, 1950, when he went on loan to Aramco for eight months. From 1951 until his death he was with Bechtel as a senior engineer. The last projects he worked on were an ammonia plant, Pascagoula, Standard Oil Libya, liquefaction of natural gas, and a project

for the Marathon Oil Company. . . . **Henry Singleton**, VI-A, Teledyne Chairman, has been elected to the board of United Insurance Company of America and has also been elected a member of the M.I.T. Corporation. . . . **Don Ross**, XV, has been promoted to Second Vice President, The Phoenix of Hartford Insurance Companies. Don joined The Phoenix in 1950, after 10 years as an underwriter and special agent for the Hartford Accident and Indemnity Company. His first assignment with The Phoenix was as casualty superintendent and later he was promoted to Assistant Secretary in 1953, and to Secretary in 1958. . . . **Mel Jackson**, S.M., VIII, has joined Machtell Laboratories, Inc., as Sales Manager for light amplifier tubes. Previously he held management and marketing positions at Northern Instrument, Del Electronics, Perkin-Elmer, Trak Electronics and Airborne Instruments Laboratory. . . . Many of you may have seen the article "I.M. Pei: An Architect with an Urban Urge" in the June 11, 1968, *Look* magazine. . . . **John Blattenberger**, V, of Cities Service Oil Company, is the author of a paper "Report of the Sub-Committee on Manual of Test Methods and Definitions of Terms," May, 1968.—**Alvin Gutttag**, Secretary, Cushman, Darby and Cushman, American Security Building, 730 15th Street N.W., Washington, D.C. 20005

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Those attending the spring get-together last May at the home of **Ed** and **Natalie Marden**, 61 Bullard Road, Weston, report a most enjoyable evening of yarn swapping, fine hors d'oeuvres, good liquor and a superb buffet dinner. In the course of the evening we learned that **Reid Weedon** has embarked on the challenging adventure of outguessing the winds as a balloonist. He uses one that is 40 feet in diameter and powered by a kerosene burner which is turned on and off depending on whether one wants to ascend or descend. Some might say that the sport is like chasing the will-o'-the-wisp, but Reid says that to him it offers true relaxation. We also learned that **Leonard Katz**, after a 25 year sabbatical, returned to M.I.T. for a brief period last winter to complete his thesis and win his Ph.D. Congratulations! Those present, in addition to Natalie and **Ed Marden**, were: Sis and **Johan Andersen**, Alice and **Ed Beaupre**, Bud and **Leona Zarsky**, Estelle and **George Hite**, Fran and **Murray Scott**, Joyce and **Leonard Katz**, Marjory and **Mitch Marcus**, Pat and **Mike Driscoll**, Dotty and **Irv Stien**, Lois and **Martin Ernst**, Pat and **Bud Ackerson**, **Reid Weedon** and **Walt Kreske**. . . . Class of '41 members attending the Alumni Dinner on June 10 at the Rockwell Cage were: **Nat Sage**, **Reid Weedon**, **Ed Marden**, Dotty and **Irv Stien**, and **Walt Kreske**.

Lyle Merton Richardson, Jr., has been elected President of the Appalachian

Mountain Club. . . **Joseph Bowman** and his wife, Virginia, attended the 20th Annual Fiesta of the M.I.T. Club of Mexico City last March. . . **J. Raymond Berry, Jr.**, reports that his current assignment is Director, Program Performance, Apollo Applications Program, Space Division, North American Rockwell. He has become a double grand-gather this summer! and believes himself to have the class distinction of being the only member having a son in kindergarten.—OOPS! . . . **John W. Kraus** carries the title of Chief, Maintainability Engineering Branch, MSSD, McDonnell Douglas, Santa Monica. John's daughter, Lin, and her husband, Tom Peters, both have masters degrees in social science from the University of Southern California and in August left for England on Fulbright Scholarships to the Tanistoell Clinic in London. John's other daughter, Gladys has twin sons who now, at age four years, appear on various national commercials! John didn't say whether his grandsons are making more money than Grandpa, but he did say that both he and his wife, Jan, are enjoying the role of being grandparents. . . . **Dr. Wilson R. Slaunwhite, Jr.**, in June of 1967 assumed the position of Research Director and Head of the Department of Biochemistry of the Medical Foundation of Buffalo, Inc., a non-profit membership corporation devoted to biomedical research. During 1967, he expanded the Department of Biochemistry and added a Department of Biophysics. Both departments work in the area of steroid and thyroid endocrinology. In January of 1968, he became an editor of *The Journal of Clinical Endocrinology and Metabolism*. . . . **Carl M. Mueller** has recently been a member of the Board of Directors of Cramer Electronics, Inc., Newton, Mass., industrial electronic distributor. Carl is a partner with Loeb, Rhoades and Company of New York. Before joining Loeb, Rhoades, he was vice president of the Bankers Trust Company of New York. . . . **Nathaniel M. Sage, Jr.**, has been named to the newly created post of Full-time Co-ordinator of Research at the University of Rhode Island. Nat has been associate director of M.I.T.'s Division of Sponsored Research. As of July 1, he undertook the supervision of the research efforts of the 10 schools and colleges at U.R.I. Last year, the total sponsored research there amounted to 4.6 million dollars. Nat formerly taught at the University of New Hampshire and at Amherst College. . . . **Francis E. Vinal** is a candidate for one of two vacancies on the Weston, Mass., Planning Board, where he has been a resident for over 17 years. Frank is a materials technologist, working in the fields of chemistry, ceramics and metallurgy as applied in the electronics industry. He received his B.A. and M.A. from Wesleyan University and his Doctor of Science degree from M.I.T. He also attended Georgetown University Law School for two years. During World War II he was a scientist for the federal government located in Washington,

D.C. After the war he became an assistant professor at M.I.T., leaving in 1955 to enter industrial work. He is presently Applied Research Manager for Instrument Operations for Laboratory for Electronics. In 1954 he received the Meritorious Service Award of the American Ceramic Society. His ceramic work, done at M.I.T., resulted in the development of computer memory elements which have become the industry standard for all high speed computers of today. . . . **John W. Ludwig** is currently Director of Advanced Systems, Vought Aeronautics Division, LTV Aerospace Corporation, Dallas, Texas. . . . **Richard A. Markey, Jr.**, has embarked upon his own business venture under the name of Markey Benziger Associates, Inc., specializing in church interiors, furnishings, seating, lighting, stained glass and art. . . . **Ben King Duffy** is currently a Project Engineer in the Design Division of the DuPont Company. . . . **James S. Cullison** was married on October 27, 1967, to Leona K. Cullison. . . . **Charles J. Shannon** is now with Mutual of Omaha, Eugene, Ore. He has five daughters, one son, and one grandson. . . . Professor **Stanley Backer** has been made a Trustee of the Textile Research Institute, Princeton, N.J. . . . **James D. McNitt**, formerly president of Bristol Laboratories, has been appointed a Senior Vice President of the parent company, Bristol-Myers Company, New York. . . . **Kenneth G. McKay**, Vice President of Engineering of the American Telephone and Telegraph Company, has been elected to the National Academy of Engineering, a private organization that advises the federal government on science and engineering policy matters. Kenneth joined Bell Telephone Laboratories in 1946. He was named vice president, systems engineering, in 1959, and became vice president of engineering at American Telephone and Telegraph in 1966. He and his wife, the former Rene Craig Smith, have two children and live at 100 Wildwood Lane, Summit, N.J. . . . **Franklin W. Kolk** was elected Vice President, Development Engineering of American Airlines, New York.

Fritz Krum has been appointed to the position of director of Corporate Engineering at G.A.F., New York City. Fritz was formerly chief engineer for G.A.F.'s photo and reprographics products. Prior to joining G.A.F. in 1964, he was executive staff engineer, assigned to the vice president of engineering and responsible for refinery and chemical plant facilities with The Lummums Company, and senior process engineer at Bechtel and the M. W. Kellogg Company. . . . **Robert L. Sinsheimer** is Professor of biophysics, Chairman of Caltech's division of biology. His most recent scientific achievement is that of participating with others in creating the first artificial synthesis of active DNA of the virus Phi X 174. . . . **D. Reid Weedon, Jr.**, Senior Vice President of Arthur D. Little, Inc., Cambridge, Mass., was guest speaker at a recent meeting of

the Board of Directors of the Electronic Industries Association. He predicted that: "Electro-optics technology, which cuts across all markets, is certain to have major additional impact on the electronics industry. The most exciting developments are likely to include laser systems, real-time computer-interactive visual displays, optical data processing and holography. It appears that we will have some form of true three-dimensional television probably involving laser technology and holographic principles by the year 2000." . . . **Harry Faul**, Chairman of the Geology Department at the University of Pennsylvania, has been assigned direction of an Atomic Energy Commission grant to investigate the applications of what may be the most sensitive time-measuring technique yet developed—the literal tracking of "atomic footprints" through all the existing sands of time. It involves the study of the phenomenon of spontaneous fission of Uranium 238 atoms in natural crystals and glasses. For unlike the Uranium 235 used in atomic reactors and weapons which requires neutron bombardment to split its nucleus and produce energy, the U-238 atom splits at random on its own. And while this happens rarely, it does so often enough, and with sufficient force to make a valuable "nuclear clock" for measuring ages of the most ancient to the most recent rocks and tracing the activities of early man as well.

Howard J. Samuels in his capacity as Under Secretary of Commerce discussed corporate urban action programs supported by the Commerce Department at the June American Management Association conference on Mobilization for Urban Action Programs held in New York City. . . . **Edward G. Sherburne, Jr.**, Director of Science Service Inc. is actively promoting the publication, *Science News*, with an offer of 39 weekly issues for \$3.43 which is \$1.45 less than the regular subscription price. Write to Science Service Inc., 1719 N Street N.W., Washington, D.C. 20036. . . . **Edward B. Lewis**, who is "Thomas Hunt Morgan Professor of Biology" at Caltech, has been elected to the National Academy of Sciences in recognition of his outstanding achievement in research in the field of genetics, and development of techniques that are widely used in studying chromosomes as well as in the relation between radiation dosage and the incidence of cancers. Edward is a past president of the Genetics Society of America and serves with the genetics study section of the National Institutes of Health and is a member of the Radiation Bio-effects Advisory Committee of the U.S. Public Health Service. . . . **Robert M. Fano** is author of an article in the *General Electric Forum* predicting that the use of the computer will reshape the whole pattern of our economic and cultural lives. He says: "The computer is the essential tool that can provide the intellectual assistance needed to make each of us more capable of dealing with growing complexities of

life." . . . **Wallace E. Howell** was recipient of this year's Award for Outstanding Contribution to the Advance of Applied Meteorology by the American Meteorological Society for his valuable contributions to the theory and practice of the modification of clouds by artificial nucleation. In 1951 he formed his own weather modification company, W.E. Howell Associates Inc., Lexington, Mass., which in 1967 was acquired by EG and G, Inc. Wallace is president of Mount Washington Observatory Inc., and an Adjunct Professor of Meteorology at Northeastern University.—**Walter Kreske**, Secretary, 53 State Street, Boston, Mass.; **Everett R. Ackerson**, Assistant Secretary, 831 Cranford Avenue, Westfield, N.J.; **Michael Driscoll**, Assistant Secretary, 63 Center Street, Nantucket, Mass.

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Elliott Friedman sent an article from *Newsday* (Long Island, N.Y.) about the Kollsman Instrument Corporation plant at Syosset and particularly about its President, **Dave Nichinson**. . . . For himself, Elliott reports that he has been Chief Engineer at Dero Research and Development Corporation in Huntington, Long Island, for the past six years. . . . From **Neil Cogan** news that he is Project Administrator in Quality Control on the Minuteman ICBM contracts at Avco's Lycoming Division in Stratford, Conn. . . . **Stuart Dunham** received an M.S. from Union College in June. . . . **Curt Buford** reports his extra curricular activities as Chairman of the Community Relations Committee of the Pittsburgh Railroads and as President of the Greater Pittsburgh and Lake Erie Railroad Company. . . . **Bernie Levere** tells us that his children are scattered from Mexico to Europe to Massachusetts for the summer. His eldest daughter, Jane, will attend Smith College in the fall. Bernie with his wife is taking a summer trip through the British Isles. . . . A note from **Bill Johnson** reports that his company making stainless steel filters by powder metallurgy methods got into production last January. You can read about it in *Machine Design*, April 11, 1968 issue. . . . **Douglas McConnell** is currently with Standard of New Jersey's Middle East Department. He is living in New York and tripping to the Middle East each year on international oil business. . . . Captain **Harry Maynard** (Retired) was a grad student with our Class. He is enjoying the good northwestern life working as Manager of the Greater Bellevue Chamber of Commerce. . . . **Bob Van Tuyle** was elected President and Chief Executive officer of Slick Corporation, Chicago Heights, Illinois.

J. C. Haas has been elected Executive Vice President and Vice-chairman of the Board of Rohm and Haas. . . . **Dale Yocum**, who was living in Overland Park, Kansas, is doing missionary work in Korea. . . . **Willis Yocum** has left micro-wave tubes and optics and is now studying tantalum thin films as

applied to Bell Systems circuits. . . . **Albert S. Knight** is sales representative for Beltraction Company of Chicago. His territory is New York State and northern Pennsylvania. . . . **Jack Williams** is still in Paris working as Vice President Group Executive (Europe) for Worthington. He is active as Vice President and Treasurer of the M.I.T. Club of Paris. . . . **Maurice Ireland** is Manager of Product Assurance at the Western Development Labs of Philco-Ford in Palo Alto. . . . A note from **George Illich** quoted in its entirety: "Nothing new—just another 'organization man'." . . . In a letter from Harold Pearson, '23, Chairman of the 1968 Fiesta Committee of the M.I.T. Club of Mexico City, tells us that Ann and **Howard Boise**, Dorothy and **Floyd Lyon** and Kay and **Jon Noyes** attended the 20th Annual Fiesta last spring. . . . The Department of Commerce, Bureau of Standards, listed **Welville Nowak's** paper, *Research in Energy Conversion*. . . . **Jim McClellan** is Weyerhaeuser's Branch Manager for paper operations at Plainwell, Mich. . . . **Eugene Sartori** of Bell Labs co-authored an article entitled "A Theoretical and Experimental Study of Transformer Balance" in the *IEEE Transactions on Parts, Materials and Packaging*. . . . Colonel **Art Swanson** has retired from the U.S.A.F. and is now Director of the Washington Centers for Computer Learning Corporation. . . . **Dr. Robert Seamans** was appointed a Director of Itek Corporation. He is consultant to the Administrator of NASA and a visiting professor at M.I.T. . . . **Dr. Frances Ross Karlan**, Director of Dental Services at Metropolitan Life Insurance Company, has been appointed a member of Metropolitan Life's administrative personnel staff. . . . **Fred Sargent** has been invited to serve on the National Air Quality Criteria Advisory Committee. . . . **Robert Ingram**, Meteorologist in charge of the Phoenix, Ariz., Airport Station, received a St. Bernard's Express Certificate from Jack Williams, Governor of Arizona, in appreciation of the Weather Bureau's assistance during last winter's 83 inch snow storm. . . . So much for the accumulated summer notes. . . . Let's hear from you now for some newsy fall and winter notes.—**Ken Rosett**, Secretary, 191 Albemarle Road, White Plains, N.Y. 10605

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The 25th Reunion flowered in a bloom of happy and exciting events, and then was carefully pressed between the leaves of our book of memories, there to be ignored but not forgotten. The following were elected as class officers: President, **Jim Hoey**; Vice Presidents, **Ken Warden** and **Chris Matthew**; Secretary-Treasurer, **Dick Feingold**; Associate Secretary, **Jack Kelly**; Class Agent, **Jim McDonough**; and last, but not least, Class Sweetheart, **Fred Kaneb**. Of course, Fred Kaneb was not officially elected as class sweetheart, but he certainly deserves the title for his extreme patience and wonderful sense of humor



Dr. Frances Ross Karlan, '42

when on the receiving end of countless, relentless attacks on his sincere (and obviously innocent) attempts to pay his way in Canadian funds. . . . About 120 classmates and wives, together with about 150 children, enjoyed three days in Cambridge and environs. . . . **E. Charlton Crocker** was promoted to Corporate Personnel Manager at Nalco Chemical Company in Chicago. **William J. Vallette** was appointed Vice President of Vaule & Company, Inc., in Massachusetts. **Bedrich Hettich** was appointed to the technical development staff at American Viscose in Philadelphia. **Herb Sanderson**, Manager for Advanced Development on the Sprint Missile program at Martin Marietta, in Florida, was selected by the Department of the Army to participate in a one-month study of advance ballistic missile defense concepts. **John G. Linvill**, who is Head of the Department of electrical engineering at Stanford University, is the author of two papers which appeared in the April and May issues of the *IEEE Transactions on Electron Devices*, and **William L. Root**, who received his masters with our Class, was the author of an article in the *IEEE Transactions on Information Theory* which appeared in May. **Irene du Pont, Jr.**, was elected a life member of the M.I.T. Corporation.—**Richard M. Feingold**, Secretary, 266 Pearl Street, Hartford, Conn. 06103; **Jack Kelly**, Associate Secretary, Esso Standard Eastern, Inc., 15 West 51st Street, New York, N.Y. 10020

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As we start down the home stretch for our 25th Reunion, it is on a note of sorrow that I open this column. From Alvin Guttat, Secretary of the Class of 1940, I learned on the last day of July that Professor F. Alexander Magoun, Secretary of the Class of 1918, died shortly after the Class of 1918 held its 50th Reunion. I understand that he



Robert E. Benedict, '44

had just completed his class notes for that reunion. Many of us heard his lectures on love and marriage. The reactions varied. I was impressed enough to later seek his counsel which he most generously gave and to enroll in his humanities course on "Human Relations." I was fascinated by the things he could divine from the Gordon and Allport "Study of Values" test and I enrolled for a course in psychometrics at Boston University. In 1952 I visited him at his home in Jaffrey, N.H. I am grateful that I had opportunity to know him.

With regard to our own forthcoming reunion I was not able to reach **Burt Bromfield**, our Reunion Chairman, but I did talk with **Bob Breck**, our Reunion Publicity Chairman. Bob tells me there have been no recent meetings but that Burt was seeking some member of the Reunion Committee to attend the Class of 1943 Reunion last June as an advance scout. Bob did not know who, if anyone, attended. Our anonymous roving reporter says that "I presume one of the big topics in the first issue (of the *Review* publication year) will be the plans for the 25th Reunion." The roving reporter seems to have the most news, namely, that Betty and **Sam Morrison** are planning to attend with their three children. He says the Morrison children are looking forward to an interesting weekend. He also says his own children have similar expectations. I trust the committee will keep the young people in mind. Class President **John Hull** held a round table on reunion plans at the Alumni Officers' Conference in September, 1966, in Cambridge. Another such conference is planned for this year in Cambridge on September 6-7 and I expect that another reunion planning meeting will also be held then. Deadline permitting, I'll report on that in the next set of notes. . . . Our anonymous reporter was roving the Design Engineering Show last spring in New York City, I believe, where he met **Herb Knappe**,

founder of flourishing Knappe Industries in Grand Rapids, Michigan. From Herb he learned that John Glendening, '47, has gone south from Kalamazoo to join Microlife Co., (food additives) in Bradenton or Sarasota, Fla. . . .

Three of our classmates have availed themselves of the opportunity to send some news of themselves with their alumni fund contributions. **Arthur F. Dershowitz** of Schenectady, N.Y., says he is a specialist in management science and technology at Silicone Products Department of General Electric. He reports that as of last July he had just returned from 10 months leave during which time he earned a Master of Science degree in statistics from the University of Wisconsin. His two boys are 14 and 11.

Albert P. Hildebrandt reports from New York, N.Y., that he has sold his business—pierced corporate veils and discarded organization labels. He is now self-employed (venture capitalist) and self-renewed (including daughter born in 1967). **Richard E. Whiffen** reports from Doylestown, Pa., that he is starting a new service business in high velocity metal forming using an electro-hydraulic technique.

As usual for the first issue in the fall the supply of clippings and articles is relatively plentiful. Here is the news from that source. **Robert E. Benedict** has been elected President and Chief Executive Officer of Phelps Dodge International Corporation, a subsidiary of Phelps Dodge Industries, and to the position of Director of Phelps Dodge Industries, the subsidiary of Phelps Dodge Corporation of New York City which coordinates and directs its manufacturing activities. That news item appears in the *Wall Street Journal* of May 28, but the press release on which the story is based gives us some additional information on Bob's earlier career. Prior to joining Phelps Dodge, he spent most of his career in shipping, first with the Moore-McCormack Lines and later with the American Export Lines. He also spent two years as economic consultant to the Commonwealth of Puerto Rico's Operation Bootstrap for social and economic development. He joined Phelps Dodge International in 1958 as manager of marketing and administration, became general manager in 1960, vice president in 1962, and executive vice president in 1966. Bob lives in Connecticut, is married, and has three children. . . . Paralleling Bob's Phelps Dodge International in the hierarchy of Phelps Dodge corporations is Phelps Dodge Copper Products Corporation. From the *American Metal Market* magazine of June 25, we learn that **Allan B. Porson**, XII, has been named Assistant Vice President of PDCPC. Allan joined them in 1947 after earning a second bachelor's degree (Course XV) from M.I.T. His most recent post has been as operations manager for tubular products.

Amicon Corporation, of Lexington, Mass., headed by **Alan S. Michaels**, S.B., S.M., Sc.D., is still growing. According to



Allan B. Porson

the Boston *Sunday Globe* of June 30, it is a year of transition for the six-year-old company. Last year, the company moved from its former location in Cambridge to a new plant on Route 28. This year, in July, it was scheduled to open a second plant in Bedford. The new plant will put the research company firmly into the manufacturing business. It will turn out membranes on a continuous, almost production line basis. About a third to a half of Amicon's business is membrane related, according to Alan, formerly a professor of chemical engineering at M.I.T. In the April, 1968, issue of *Industrial Research*, Alan published an article entitled "Membranes: The Thin Difference." In that article Alan compares the current state of development of membrane technology with the state of semiconductor technology in the late 1940's and early 1950's. He adds: "If the history of applications development of solid-state devices during the past 20 years can be considered a guide, the future of membranes and membrane technology in the coming decade should be startling." In the *Globe* article, Alan foresees growth to \$10 million in sales within four to five years from the present \$1.6 million. Currently a privately held company, the *Globe* writer indicates that the firm will stay private for another year or so. . . . Another president and writer is **Holton E. Harris**, VI, President of Harrel, Inc., East Norwalk, Conn. An article entitled "New Techniques in Temperature Control" appears in the May, 1968, issue of *Modern Packaging*. Holton earned both his S.B. and S.M. degrees at M.I.T. The article is based on a paper delivered by Holton at the 1967 Conference of the Packaging Subcommittee of the IEEE. . . . Speaking of papers, **Will B. Rodemann**, now Director of Corporate Marketing at Varian Associates in Palo Alto, Calif., was to deliver a paper to the 16th Annual Marketing Conference sponsored by the National Industrial Conference

Board, according to our roving reporter who received a copy of the program. The topic is applying mathematical techniques to marketing problems. From *Aviation Week* for May 20, we learn that three new divisions have been established at NASA's Lewis Research Center (propulsion) in Cleveland, Ohio. Heading the new Launch Vehicles Division is **Edmund R. Jonash**, formerly project chief for Centaur. The new division is comprised of the former separate Centaur, Agena, and Atlas project offices. The division will be responsible for all of Lewis' launch vehicle programs. . . . From American Oil Co., we learn by press release of May 24, that **James J. St. Germain** has been appointed Director of Reseller Project Development in the American Oil Company marketing department. Jim joined the company in 1950 at New Orleans and also served in the Chicago sales office before becoming chief engineer for planning and projects at the General Office the first of this year. . . . **A. Donald Arsem**, VI, has been elected as Executive Vice President (Manager of Engineering and Research) for The Wurlitzer Company, according to a press release of July 3. He was previously a senior vice president of the firm. He will continue to maintain his headquarters at the North Tonawanda N.Y., facility and will continue to supervise the company engineering and research departments located there. Prior to joining Wurlitzer in 1958, Don worked at RCA in the development of radar tracking techniques and systems design. Later at General Electric he was responsible for development of the Hermes and original Atlas missile guidance systems. Don is married and the father of three daughters and a son. He and his family reside in Clarence, N.Y. . . . That's it. Resolve to vote in November and to write to your class Secretary. Happy Thanksgiving!—**Paul M. Robinson, Jr.**, Secretary, Information Systems Division, Office of the Chief of Naval Operations, Pentagon 2B330, Washington, D.C. 20350, 202-697-6115 or 7710 Jansen Drive, Springfield, Va., 22150. Assistant Secretaries, **Paul M. Heilman**, Copper Development Association, 405 Lexington Avenue, New York, N.Y. 10017, or 30 Ellery Lane, Westport, Conn. 06880; and **John G. Barmby**, I.I.T. Research Institute, 1825 K Street, N.W., Washington, D.C. 20036, 202-296-1610

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It is mid-August and 95° in the shade here in Connecticut yet it shall be early fall before you feast your eyes upon these newsy tidbits! Permit me to apologize for the lack of notes and apparent inattention to my secretarial duties. I fear this past year has been my leanest in 18 years at this enjoyable task. Bursts of news clippings and other correspondence always shock me into writing. Need I say more! . . . **Thomas I. Stephenson, III.**, became Works Manager of Alcoa's New Kensington, Pa., Fab-

ricating Plant in mid-May. Steve, as most of you know, has been Alcoa through and through. A native of Knoxville, Steve began work at Alcoa, Tenn., as a summer employee in 1940. In 1946 Tom returned to the same plant as a staff engineer, and in 1951 joined the construction engineering division where assignments included activities at Point Comfort, Texas and Surinam in South America. . . . Steve served as assistant chief engineer in New Kensington in 1959-1960 before returning to the construction division and a stay with Imperial Aluminum Company in Wales. For the past six years Tom has been a Technical Manager at the Warrick Works in Evansville, Ind. Yes, Steve has found time for the usual community activities such as Boy Scouts, Red Cross, Philharmonic, etc.

Commander **Sam Moore**, formerly on the USCG 3rd District Staff on New York's Governor's Island, became Commanding Officer of the Half Moon (WHEC-378) in mid-July. I had lunch with Sam a couple of times during the past winter and it was most interesting to hear first-hand of the Coast Guard's trials and tribulations in taking over Governor's Island that had been an Army Base almost 200 years. Sam you will recall was one of the stalwarts who attended last year's "special" Bermuda reunion along with **Bob Maglathlin** among others. Speaking of Bob, our class representative to Alumni Council, it is my understanding that he has left Sylvania to become Manager of the Technical Staff at Raytheon's Radar and Electronics Laboratory in Bedford. . . . **Dave Trageser** was appointed general manager of High Voltage Engineering Corporation's Industrial Division in mid June. In this new position, Dave will supervise several joint ventures with other companies as well as the wide world sale and lease of High Voltage electron accelerators. **John J. McMullen** was elected to the office of President and Chairman of the Board by United States Lines in early July. Mr. McMullen, an ex-officer of the Navy, has also served the U.S. Maritime Administration as Chief of the Office of Ship Construction and Repairs and is President of John J. McMullen Associates, marine engineers, naval architects and consultants. . . . **Kirk Drumheller**, an engineer and manager at the Hanford Project since 1951 has been named associate manager of Battelle-Northwest's Chemistry and Metallurgy Division. In this position, Kirk—most recently Manager of Materials Development—will assist the division manager in administering the R and D activities of six technical departments. During this past spring, Kirk and I had several "airport-type" phone conversations, but never were able to see one another. Your Secretary hopes that Kirk will continue his irregular trips to Washington. The May, 1968 issue of *Bulletin of the Atomic Scientists* contained an excellent article by **Alan G. Mencher** entitled "Management by Government: Science and Technology in Britain." Alan is

Scientific Attache at the American Embassy in London. Dr. **Robert J. McKenna** is President—Junior Section of the Los Angeles County Medical Association and more recently was elected to the Board of the American Cancer Society in California.

In mid May, **Al Bowen** thoughtfully sent a card from Ocho Rios, Jamaica, reporting upon his vacation! Al has had a particularly busy 1968 mainly due to taking on the Presidency of a new company called Forwarders Intermodal Container Corporation (FICO), an enterprise owned by 49 foreign freight forwarders, only one of which is Al's own company, Albert E. Bowen, Inc. FICO joined 49 competing companies together for the purpose of consolidating small lot cargoes into containers for overseas shipment with, as you might expect, the usual Anti-Trust problems, labor problems, etc. . . . **Edgar Andrews** continues with Fischer & Porter, manufacturers of instruments and control systems, as Southern Sales Manager with headquarters in Birmingham, Ala. **Sherry Ing**, the squire of Hawaii, continues busy with his many, many activities so **Kirk Drumheller** reported in one of our spring phone conversations. . . . **Dave Mintzer**, Professor of Mechanical Engineering at Northwestern University serves as Vice Chairman of a Faculty Council to coordinate a Theoretical and Applied Mechanics Program. Did I report to you last spring that **Hal Thorkilsen** had left American Safety Razor and New York City for the greenery of Cape Cod and Ocean Spray Cranberry? **Dan Meckley**, recently appointed a Director of the U.S. Standards Institute, serves as Vice President of engineering and manufacturing of The Tappan Company, an Ohio based kitchen appliance manufacturer. Dan joined Tappan in 1958 after service with the York Division of Borg Warner. **Elios Cirelli** reports that he is associated with Royal Typewriters R&D Center as a Design Engineer.

Rev. **John O. Von Hembert** remains in Virginia—Northwood Circle in Lynchburg. After 15 or more years on the waterfront in East Greenwich, R.I., **Ed Washburn** has moved to Lynnfield, Mass. Prexy **Tom Hewson** after many years with St. Regis Pulp and Paper has joined Dick White's, '48, Automation Engineering Laboratory in an executive capacity. **Walt Kowaleski** continues, we believe, with Bethlehem's Sparrow Point, Md. facility. Your Secretary has been appointed to a three-year term on the Alumni Day Committee. Did you all catch **Vince Butler's** picture in the May *Review*? He is on page 91 if you can find this issue. **Julian Busby** continues in the oil wildcat business with headquarters in Charlestown, W. Va. We spent a few hours with Buzz in late March when he was in town searching for financial partners. Although a wildcatter's life may be exciting, it is by no means easy. . . . Just found a 1960 letter from **Phil Pocock** which I shall save until next month. . . . Tomorrow

SPECIAL REDUCED RATES FOR M.I.T. ALUMNI

FOURTH AND FIFTH ANNUAL TOUR PROGRAMS—1968-1969

This unique program of tours is offered to alumni of Harvard, Yale, Princeton and M.I.T. and their families. The tours are based on special reduced air fares which offer savings of hundreds of dollars on air travel. The tour to India, for example, is based on a special fare, available only to groups and only in conjunction with a tour, which is almost \$400 less than the regular air fare. Special rates have also been obtained from hotels and sightseeing companies. Air travel is on regularly scheduled jet flights of major airlines.

The tour program covers four areas where those who might otherwise prefer to travel independently will find it advantageous to travel with a group. The itineraries have been carefully constructed to combine the freedom of individual travel with the convenience and saving of group travel. There is an avoidance of regimentation and an emphasis on leisure time, while a comprehensive program of sightseeing ensures a visit to all major points of interest. Hotel reservations are made as much as a year and a half in advance to ensure the finest in accommodations.

THE ORIENT

30 DAYS \$1549

Sept. 21, 1968
Mar. 22, Jun. 28, Jul. 26,
Sept. 20, 1969

1969 will mark the fifth consecutive year of operation for this fine tour, which offers the true highlights of the Orient at a sensible and realistic pace. Eleven days will be spent in JAPAN, divided between TOKYO, the ancient "classical" city of KYOTO, and the FUJI-HAKONE NATIONAL PARK, with excursions to NARA and NIKKO. Five days will be spent in HONG KONG and four in the fascinating city of BANGKOK. Shorter visits to SINGAPORE and the lovely island of FORMOSA complete the itinerary. Optional pre and post tour stops may be made in HONOLULU and the WEST COAST at no additional air fare.

A complete program of sightseeing will include all major points of scenic, cultural and historic interest. Features range from a tour of the canals and floating markets of Bangkok, an authentic Javanese "Rijsttafel" in Singapore, and a launch tour of Hong Kong harbor at sunset, to a "Mongolian Barbecue" in Taipei, and a trip on the ultra-modern 125 m.p.h. express trains of Japan.

Tour dates have been chosen to coincide with outstanding seasonal attractions in Japan, such as the spring cherry blossoms, the beautiful autumn leaves, and some of the greatest annual festivals in the Far East. Total cost is \$1549 from California, \$1719 from Chicago, \$1787 from New York.*

INDIA

Including NEPAL and PERSIA
29 DAYS \$1549

Aug. 3, Oct 5, Oct. 12, 1968
Mar. 15, Mar. 22, Aug. 2,
Oct. 4, 1969

An unusual opportunity to see the diverse and fascinating subcontinent of India, to-



gether with the once-forbidden kingdom of Nepal and the rarely-seen splendors of ancient Persia. Here is India from the mighty Himalayas to the palm-fringed Bay of Bengal: the great seaport of BOMBAY; the magnificent cave temples of AJANTA and ELLORA, whose thousand year old frescoes are among the outstanding achievements of Indian art; MADRAS, in the south; the great industrial city of CALCUTTA; a thrilling flight into the Himalayas to KATHMANDU, capital of NEPAL, where ancient palaces and temples abound in a land still relatively untouched by modern civilization; the holy city of BENARES on the sacred River Ganges; AGRA, with not only the Taj Mahal but many other celebrated monuments of the Moghul period such as the Agra Fort and the fabulous deserted city of Fatehpur Sikri; the walled "pink city" of JAIPUR with an elephant ride at nearby Amber Fort; the unique "lake city" of UDAIPUR, with its delicate white marble palaces; the great capital of NEW DELHI; and the fabled beauty of the VALE OF KASHMIR, surrounded by the snow-clad Himalayas. PERSIA (Iran) includes visits to PERSEPOLIS, the great royal capital of Darius and Xerxes in the 5th century B.C.; and ISHFAHAN, the fabled city of the 15th-17th century Persian Renaissance, with its palaces, gardens, bazaar, and famous tiled mosques. Outstanding accommodations include hotels that once were palaces of Maharajas and luxurious houseboats on Dal Lake in Kashmir. Total cost is \$1549 from New York (\$1599 in 1969).*

SOUTH AMERICA

31 DAYS \$1599

Jan. 18, Jul. 26, Oct. 18, 1969

An original itinerary which takes unusually full advantage of South America's great scenic and cultural attractions. The trip descends along the West Coast, dominated by the towering Andes and filled with the churches and mansions of 16th and 17th century Spain, and returns through the modern cities and lush scenery of the East Coast. Stops include Spanish colonial QUITO, with the nearby Indian market at AMBATO and a drive along the snow-capped peaks of "VOLCANO ALLEY"; Pizarro's great viceregal capital of LIMA; the ancient city of CUZCO and the fabulous "lost city" of MACHU PICCHU; lovely SANTIAGO in Chile; cosmopolitan BUENOS AIRES, the continent's largest city; BARILOCHE, in the beautiful ARGENTINE LAKE DISTRICT; spectacular IGUAZU FALLS (largest in the world); the sun-drenched beaches of RIO DE JANEIRO (considered by many the most beautiful city in the

world); the quaint and historic town of OURO PRETO (so revered by Brazilians that the entire town is preserved by law as a national museum); the striking contemporary architecture of BRASILIA; and PANAMA CITY with the Panama Canal, Spanish ruins, and free-port shopping. These great points of interest are complemented by an assemblage of South America's truly outstanding hotels. Total cost is \$1599 from New York.*

EAST AFRICA

22 DAYS \$1549

Jan. 26, Jul. 13, Jul. 27, 1969

A luxury "safari" to the great national parks and game reserves of Uganda, Kenya and Tanzania. These offer a unique combination of magnificent wildlife and breathtaking natural scenery: great herds of elephant in QUEEN ELIZABETH PARK, in the shadow of the fabled "Mountains of the Moon"; a launch trip on the White Nile through hippo and crocodile to the base of the thundering MURCHISON FALLS; multitudes of lion and other plains game in the famous SERENGETI PLAINS and the MASAI-MARA RESERVE; the spectacular concentration of animal life in the NGORONGORO CRATER; tree-climbing lions around the shores of LAKE MANYARA; and the AMBOSELI RESERVE, where all types of big game can be photographed against the towering backdrop of snow-clad Mt. Kilimanjaro. Air travel is used where possible, enabling longer stays within the parks. Also seen are the fascinating capital cities of KAMPALA, NAIROBI and DAR ES SALAAM, the exotic "spice island" of ZANZIBAR, and the historic MOMBASA, a beach resort on the Indian Ocean, with its colorful Arab quarter and great 16th century Portuguese fort. Tour dates have been chosen for dry seasons, when game viewing is at its best. The altitude of most areas provides an unusually stimulating climate, with bright days and crisp evenings (frequently around a campfire). Accommodations range from luxury hotels in modern cities to surprisingly comfortable lodges in the national parks (some equipped even with swimming pools). Total cost from New York is \$1549.*

***Special rates from other cities on all tours. Tour cost includes Jet Air, Deluxe Hotels, Meals, Sightseeing, Transfers, Tips and Taxes.**

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Please specify tour and year in which you are interested.

we leave on a ten-day race-cruise aboard Ralph Evans, '48, new Hughes 38 sloop.—**C. H. Springer**, Secretary, MFB Mutual Insurance Company, Room 2650, 420 Lexington Avenue, New York, N.Y. 10017

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Trust that all had a pleasant summer and are well rested for the year's endeavor. We are back down to one collie in the family and believe me my course XV training does not make me a successful dog breeder. . . . A rather sad note opens the summer mail. Mrs. Fred Paradise writes that her son, **Fred Paradise Jr.**, died of a heart attack in February of this year. Mrs. Paradise advises that she will be living with her daughter in California. Apparently Fred was a bachelor, or so thought his roommate from school, John B. Williams. By a strange twist of fate it turns out that John is a fellow employee of mine with Ingersoll-Rand. . . . **Eddie Kane** is now Manager of Market Development for the Utility Division of Combustion Engineering at Windsor, Conn. We missed you at the 20th reunion, Ed, maybe we'll tie into each other at the power conference in Chicago. . . . As I think of power I am reminded that I ran into Bill Verrochi, '43, at a Pennsylvania Power meeting in the late spring. Bill, who graduated with our Class, has affiliated with the Class of '43. He was the featured speaker at the affair and ended up doing rather well on the golf course. He is now a Vice President at Penelec in Johnstown, Pa. . . . **Eugene Wejman** advises he was recently named General Manager of the Oxford Pickle Company in Cambridge, Mass. . . . **Dave Clapp** sends an interesting little note that he and his family are enjoying their stay at Kwajalein Marshall Islands where he is working at the Lincoln Lab Project Press Field Station. Year round tennis, sailing, scuba diving, golf, etc. occupy Dave's leisure time but he is still a good New Englander missing his cradle of civilization, Boston by name. If I recall, Dave was originally from Wellesley or vicinity. . . . This issue needs all kinds of space for reports from the reunion classes so I will close with a note from **Louis Wenzell** who advises: "Fat dumb and happy. Five kids, one wife, lots of bills, but life is fun." Drop me a note.—**Dick O'Donnell**, Secretary, 28516 Lincoln Road, Bay Village, Ohio 44140

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Our 20th Reunion at Martha's Vineyard on June 7-9 was a delightful example of a "lost weekend." The Harbor View Hotel in Edgartown is set back from the shore about 300 feet, and within hours of arrival everyone was sharing the "island atmosphere." This was the fourth reunion at which old friends and new friends of the Class of '48 had gathered to share plans and our accomplishments. The weather has co-operated every time: in

1953 at Plymouth, Mass.; in 1958 at Lennox, Mass.; in 1963 at the Belmont Hotel in Harwichport; and this year on Martha's Vineyard we have enjoyed the luxury of clear sunny days to relax and reminisce. The Chairman of the Reunion Committee, **Sonny Monosson**, arrived four days before the weekend to complete the details of the arrangements. Imagine his surprise when he found that the "new" addition to the hotel was so new that it was not even complete. Typical of the superlative job that Sonny accomplished to plan the reunion, he pitched in with a paint brush to help finish the rooms before the weekend.

The ferry from Woods Hole brought most everyone to the island. **Ralph** and **Annette Vacca** came in their boat from Boston, as did **Alicia** and **George Wayne** with crew, **Natilie** and **Herbert Marcus** and **Sorina** and **David Vigoda**. **Gloria** and **Norman Kreisman** (Washington, D. C.) and **John** and **Janey Kirkpatrick** (Los Angeles) were among those who flew in on the Sea-gull Airlines. **Joan** and **Dick Baker** (Mamaroneck, N. Y.) also took the ferry, after Dick had called his broker and bought a controlling interest in the ferry management so he could order a space for his car on the ferry. The entire operation took Dick only five hours.

Norman Seltzer of Lexington, Mass., arrived after Dick, and Norm was given a space more quickly when they learned that he was a classmate of Dick Baker. . . . Precise statistics on the number attending the reunion would probably be available if we were liberal arts majors—**Sonny Monosson's** guess was that 100 members of our class brought 80 of their wives, who had in tow 40 children and one dog. Those attending will not forget the delicious meals and ample accommodations, so I won't bore the rest of the Class with these details.

Herb Lipson and **Herb Kurinsky**, sports themselves and members of the committee to arrange the sports program, played needle-in-the-haystack looking for a tennis court. However, using the latest in electronic detection devices they located a court in time for the tennis players to make "love." The detection device is classified top secret by Herb's employer, our Uncle Sam, and the only comment which can be made without violating security rules is that while driving around the island with this device, the car that Herb borrowed consumed 15 gallons of gasoline (the island is 14 miles by 8 miles). . . . **Cal Boll** (Linden, N.J.) won the tennis singles contest. At the banquet when he was awarded the magnificent trophy, he explained that he had won it by beating his wife. **Ken Brock** and **Bev Freedman** won the tennis doubles. . . . **Tom Powell** and **Bill Hart** (Glens Falls, N.Y.) scored 83 at golf and shared the award. **Harry Otobrine** (Wellesley, Mass.) excelled in a swimming race over some rather formidable opposition. . . . Bicycles were available and were used. Originally, 25 bicycles were reserved, but the quantity had to be increased to 65 bicycles to fill the needs. **Denny McNear** (San Francisco)

and **Moe Rifkin** (Washington, D.C.) took the mini-ferry to Chappaquaddick Island and bicycled there. **Bob** and **Dot Bliss** (Wenham, Mass.) bicycled to South Beach, the great Sand Beach that extends the length of the island. **Dave Cist** and his wife (Wilmington, Del.) explored around Edgartown, the charming island community where we were located. . . . Saturday afternoon two busloads of us toured the island. We followed the sheltered beach from Edgartown to Oak Bluffs, where we passed the Methodist camp meeting ground literally covered with a maze of gingerbread houses built in the 1880's. On to Vineyard Haven, the bustling community that is the year-round landing for the ferry that serves as a batch-feed umbilical cord for the island. We rolled along shaded roads through lush farmland to a height of land overlooking Menemsha Bight and the small fishing village, and on to Gay Head where magnificent multi-colored sand cliffs towered over the gem-blue ocean. The wind and rain have eroded the cliffs and have formed uniquely sculptured pinnacles. **Francis** and **Gordon Johnson** (Washington, D.C.), **Alicia** and **George Wayne** (Newton), **Lou Kreek**, **Gloria** and **Sonny Monosson**, **Genie** and **Dave Finnegan** (Rhode Island) and **Phyl** and **Chuck Licht** (Chicago) were a few of the hardy souls who slid down the cliffs to the beach below. Close-up the sand sculptures were even more remarkable than they appeared from the top of the cliff. Traces of color, leached areas, and streaked red stains were some of the parts which, when summed, equalled the majestic cliffs.

After returning to the hotel, we relaxed and dressed for dinner. A brief Class Meeting at 6:00 p.m. was conducted by **Bob Bliss**, who had been Class President from 1958 to 1963. **Ben Brettler**, Class President from 1963 to this year, couldn't be with us, but with Dave Cist and Bob's agreement, Ben recommended we continue our practice of rotating class officers. Accordingly, the following nominations were made by Bob Bliss: for president—**Sonny Monosson** (Newton); for vice-presidents—**John Reid** (New York), **Arnold Singer** (Houston), and **Denny McNear** (San Francisco); for secretary—**Martin Billett**; for assistant secretaries—**Bob Day** (Philadelphia) and **David Vigoda** (Newton); and for treasurer—**Verity Smith**. As usual, there was a hushed silence when Bob Bliss asked for additional nominations, so it was surprising when David Vigoda moved to close them. Bob had to rule David's motion out of order since he was a nominee. David explained that he wasn't anxious to be elected, but was trying to expedite the election process. After appropriate steps in accordance with *Robert's Rules of Order*, the secretary was directed to cast a vote electing all the nominees. . . . Before turning the meeting over to Sonny Monosson, our new President, Bob Bliss called for a show of thanks to the 20th Reunion Committee which had been chaired by Sonny. Bob an-

nounced that Ben had appointed **Dennis Allegritti** (Chicago) as Class Agent and **George Wayne** (Newton) as 25 Year Gift Chairman. Sonny thanked the Reunion Committee members for their help and asked for a volunteer for Chairman of the 25 Year Reunion. . . . The Reunion Committee assisting Sonny was as follows: **Martin Billett, Bob Bliss, Ben Brettler, Ken Brock, Dave Finnegan, Dave Freedman, Dick Harris, Howard Jacobson** (Scranton, Pa.), **Bill Katz, Warren King** (Chicago), **Herb Marcus, Bob Mott, Don Noble, Ralph Reis** (New York), **Norman Seltzer, Verity Smith, David Vigoda, John Walch** (Newark), **George Wayne, Bob Wolfsey, and Ted Yoos.**

Next month the Class Notes will describe the banquet and leaving the island. In closing, I cannot resist describing the view before me as I write these notes. Trees like soldiers marching down to the shore are in the foreground; and stretching beyond—the sea touches the harbor entrance before the interruption of Cranberry Point in the distance. Further out but hidden in the haze of the early morning is Petit Manaan Lighthouse. The sun is already high in the sky, but the birds have not ceased their songs of joy about this delightful piece of coast here in Birch Harbor, Maine. Until we meet again.—**Martin Billett**, Secretary, 16 Greenwood Avenue, Barrington, R. I. 02806

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So far (mid-August), 180 affirmative replies have arrived in response to our Bermuda Reunion questionnaire. Adding wives and children which were listed, the tentative attendance at the Castle Harbour Hotel is over 400. Since all further mailings will go only to those who respond, please get your cards back to Stan Margolin, Reunion Chairman, or to the undersigned. . . . **Ken Pettengill** has been promoted to Director of Chemical Engineering of Emery Industries, Inc., of Cincinnati, Ohio. In his new position, Ken will be responsible for chemical engineering function at all of Emery's facilities. **Ersine N. White, Jr.**, has been appointed President of the Gorham Corporation (silverware) in Providence, R.I. Gorham is a division of Textron, Inc. **Arthur C. Kirkwood** of Kansas City, Mo., has been elected to a second term as a Vice President of the National Society of Professional Engineers. Mr. Kirkwood received his master's degree in electrical engineering from Tech after obtaining an A.B. in mechanical engineering from Stanford University. He holds memberships in the Kansas Engineering Society, A.S.M.E., I.E.E.E., A.W.W.A., A.I.C.E., Rotary Club of Kansas City, Kansas City Area Council of the Boy Scouts of America, and the National Association of Housing and Redevelopment Officials. **William J. Raich**, of Midland, Mich., has been named section leader in the Coating Materials Laboratory of the Dow Chemical Company's Midland Division Plastics production Research

Service. Bill will be responsible for research on saran latex and lacquer coatings. He received master's and doctor's degrees in chemistry from the University of Nebraska in 1954 and 1957 respectively.

William G. Atkinson has been named overhaul program manager responsible for overhauls and conversions and other work aboard commissioned ships through the guarantee period for General Dynamics-Electric Boat in Groton, Conn. Bill joined Electric Boat in 1954. **Manuel B. Gassman** has been named Corporate Vice President for Sales at Maynard Plastics, Inc., a Salem, Mass., manufacturer of plastic extrusions and components for industry. Manny lives in Peabody with his wife, Charlotte, and their three children, Jeffrey, 15, Edmund, 10, and Wendy, five. Dr. **Benjamin W. Roberts, S.M.**, VIII, writes fascinatingly in the March issue of *Engineering Education* about VITA (Volunteers for International Technical Assistance). Briefly, VITA is the Peace Corps of the engineering and scientific field by means of which the technical man can use his know-how most rewardingly to help solve problems which plague people all over the world. Some typical projects include a VITA-designed parabolic solar cooker, bamboo wheelbarrow, windmill design, low-cost surveying transit, etc. The March, 1968, issue of the *IEEE Transactions on Magnetics* contains an article by Guest Editor **Donald O. Smith** about the Third International Colloquium on Magnetic Films. Dr. Smith is a staff member at the M.I.T. Lincoln Laboratory, Lexington, Mass., where he is engaged in magnetic film work directed toward computer memory and componentry.

William W. Lang, Senior Physicist and Manager of the Acoustics Laboratory for IBM in Poughkeepsie, N.Y., has written in the *Journal of the Audio Engineering Society* for April about the progress and problems which concern those in the field of international standards for audio and electro-acoustics. Since these standards apply to hearing aids, hi-fi, shock and vibration, medical applications of ultrasonics, and numerous other areas, Bill's work is of importance to all of us. While on the subject of acoustics, Dr. **Ira Dyer** of Bolt, Beranek, and Newman in Cambridge, Mass., is a Member of the Executive Council of the Acoustical Society of America.

Tuhin K. Roy, SM, X-A, is a member of the Editorial Advisory Board of the *Indian and Eastern Engineer*, the oldest and foremost engineering journal in India. Rice University has given the George R. Brown Award for Excellence in Teaching to **Harold E. Rorschach, Jr.** Professor Rorschach is Chairman of the Department of Physics at Rice in Houston, Texas. **Angelo R. Arena**, of Newport Beach, Calif., has been named Assistant to the President of John Robert Powers Cosmetics, Inc., Mr. Gene D. Wilken. He was previously western regional manager with head-

quarters in Los Angeles, Calif. Angelo has had a long merchandising career during which he served as merchandise manager of Bullocks's department stores in Los Angeles. Previously he had been a cosmetics buyer for Abraham and Straus department stores in Brooklyn, N.Y. and the Broadway chain of department stores in Los Angeles. Angelo, with his wife, Alice, and daughter, Cita, will relocate in New York City where his office will be at 681 Fifth Avenue. **Richard K. Pitler** writes that he is currently Director of Product Development for Allegheny-Ludlum Steel in Pittsburgh, Pa. He received M.S. and Ph.D. degrees from R.P.I. in 1956 and 1964 respectively. He and his wife, the former Jeanne Higbie, live in Gibsonia, Pa., with their three children, Steven, 15, David, 13, and Andrew, 10. **Roland Jalbert** says that after 10 years of teaching at the University of Alaska he is now back in health physics at the Los Alamos Scientific Laboratory in New Mexico. **James S. Munro, Jr.**, writes that his company (Roy B. Rendle and Co., Inc.) has recently acquired Essex Engineering, Inc., of Lynn, Mass., which turns out specialized metal products and equipment of every description from the simplest to the most sophisticated.

Robert S. Crosby tells us that he is Head of the Aeronautical and Marine Quality Assurance Section of the Canadian Forces Material Command, Ottawa. By now, if all went according to plan, Bob is retired and living in Banff, Alberta. **Charles H. Kahn** writes that he is leaving North Carolina State University in June after nine years, the last three as Professor of Architecture, to become Dean of the School of Architecture and Urban Design at the University of Kansas. **John Marvin's** wife writes . . . "a family in Milton, Mass. . . a sales office in Providence, R.I., a fishing fleet scattered along the New Jersey coast, a plant in southern New Jersey, and a plant in Maryland make John Marvin a juggler of priorities. Though constantly on the look-out for dedicated and able executives he does most of the catching and tossing himself. If you find him inactive in the Alumni Association, it's not from lack of interest." A note from **Walter E. Seibert** states: "I am now working back in New York with Parsons-Jurden Corporation, rated the largest engineering and construction firm in the world, after 16 years in Canada and Mexico with various mining companies. My wife and six children are very happy to live in the U.S.A.—Teaneck, New Jersey." **Robert F. Steinhart** says: "My present position is Manager of Education and Communications at IBM's Management Information Systems Center in Mahwah, N.J. My wife and I and our four children aged 8, 11, 13, and 15 live in Springfield, N.J."

Theresa Urich (Mrs. Clyde M. Adams) writes: "Mel has been appointed the first Pelton Professor of Metallurgical Engineering at the University of Wisconsin in Milwaukee. He will assume his post at UWM in September. New

address: 4676 North Lake Drive, Milwaukee, Wis. 53211." **Richard Sundback** is General Manager of Heatrex Division of the Singer Company in Meadville, Pa. Heatrex manufactures metal sheath electric heating elements and devices. **Murray Glauberman** has been elected Vice Chairman, Automotive Division, Chemical Specialties Manufacturing Association. He has also been elected to a two-year term on the Executive Board. **William S. Hutchinson, Jr.** is presently doing systems analysis on rural security in Thailand for Cornell Aeronautical Laboratory, Buffalo, N.Y., under contract with the Advanced Projects Research Agency of the Department of Defense. **Arthur J. Morrow** works at PRD Electronics, Inc., a division of Harris-Inter-type Corporation, as Program Manager for VAST (R and D). **Douglas M. Van Patter**, Ph.D., VIII, has just completed a three-year stint on the Advisory Council for Engineering, Queen's University, Kingston, Ontario. **Blair L. Manning** has been with the Caterpillar Tractor Company with 12 years residence in South America—Peru, Argentina, Brazil. Since September, 1966, he has been in Glasgow, Scotland, as Sales Manager for Caterpillar Tractor Company, Ltd. (all sales in United Kingdom). By coincidence he lives across the street from our old 15th Reunion Committeeman, **Neil Morrison**. **William C. Schneider** is still the Apollo Mission Director for NASA. **Theodore C. Hossfeld** writes: "I'm getting greyer." And on that we'll close.—**Fletcher Eaton**, Secretary, 42 Perry Drive, Needham, Mass. 02192

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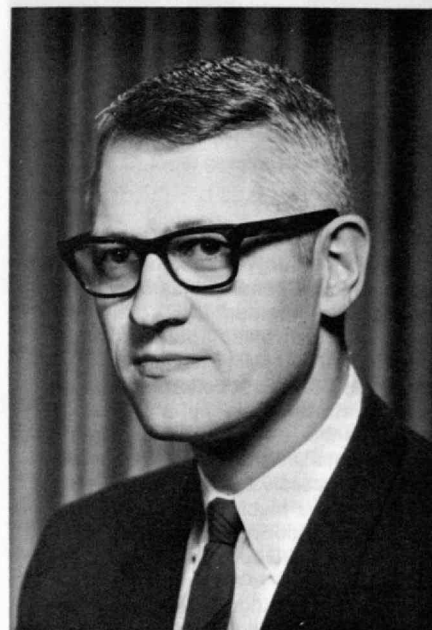
Robert C. Brouns is a Colonel in the Air Force. His current position is Chief, Vela Satellite Branch, Advanced Research Projects Agency, Department of Defense. Bob and Jane live in Alexandria, Va., and have five children (four girls ages 10 to 23, and a boy eight). . . .

John Dunn, Jr., and Marjorie are living in Sharon, Mass. John commutes into Boston where he is a Professor in the Mechanical Engineering Department at Northeastern University. The Duns also have five children, but the oldest are boys ages eight to 14, and the youngest is a girl age four. . . . An apology to **Ralph Evans**: Ralph is with R.C.A. and has taken assignments in several different cities. He is now assigned to N.A.S.A. in Greenbelt, Md. He has joined the M.I.T. Club of Washington, D.C., where he recently heard Walter Washington, the Mayor of D.C., speak on how our alumni can aid the Washington, D.C. problems. The apology, by the way, is due Ralph because we accused him of doing more skiing and sailing than working—obviously this isn't so but merely reflects our own envy at his still being able to do all of these things. Ralph is one of our few remaining bachelors. . . . **Richard Fidler** is Director of Engineering at Sylvania Electronics Systems, East

Division. He lives in Sudbury, Mass., and has four children. . . . From San Antonio, Texas, we have learned that **E. B. Flowers** is a self-employed architect. He and Virginia have a son, Parker, 6, and a daughter, Laura, 5. . . . **Myron Lecar** is with the Smithsonian Astrophysical Observatory in Cambridge, Mass., working on the structure and evolution of galaxies. I guess that this wouldn't be spectacular news if you didn't know that Myron graduated in Course XV. After a year as an assistant to the Vice President of an aircraft firm he returned to school, got his M.S. in mechanical engineering and went into the Navy where he was assigned to a special weapons group in Albuquerque. During this period, his interests changed and he went to Yale for a Ph.D. in astronomy. He has been at the Naval Research Laboratory (Project Vanguard), and at the Institute of Space Studies in New York. His comment on the universe: "Galactically speaking (where a galactic year is the time required for the sun to make one complete revolution about the center of our universe, 250 million earth years), the universe is 40 galactic years old, earth 12, and man three months." . . . **Edwin J. Martin, Jr.**, is with Wilcox Electric (subsidiary of WABCO). He teaches evening undergrad courses at the University of Missouri at Kansas City and advises grad students on thesis problems at the University of Kansas in Lawrence, Kansas! He likes to camp and fish in the Missouri Ozarks and has been taking flying lessons. . . . **Milton Neuman** and his wife, Gay, attended the M.I.T. Club of Mexico's Fiesta in Mexico City.

William Miller is Manager of Engineering at General Electric, Erie, Pa. . . . **Dick Packard**, who obtained his S.M. in Course X with us, wrote to update his activities. He is now with N.A.S.A. in Cambridge, Mass., as a Staff Scientist. After leaving Tech he spent a couple of years in the Army Corps of Engineers (including duty in Korea), and then returned to school. He received another master's degree at Yale and a doctorate at New York University. He was an Assistant Professor at Northeastern and held responsible development positions at Transitron, Honeywell, and Melpar prior to joining N.A.S.A. . . . **Dave Ragone** presented a paper titled "An Electrically Rechargeable Zinc-Air Battery for Motive Power" at a Power Systems Symposium sponsored by the U.S. Department of Health, Education and Welfare. . . . **Gordon Rampey** is with FMC Corporation's Organic Chemicals Division, Nitro, W. Va. I am surprised that he and Bertha didn't give up on number three, but their record is now boy, boy, girl, and boy one year old in November. . . . **Tom Rosenberg** is now with Douglas Aircraft Company, Missiles and Space Division, Huntington Beach, Calif. He and Zahava are an all-girl (three) family. Tom and his family were forced out of Cuba when Castro took over. . . . **Jay Rosenfield** is back in New England after a stint with Zerex. He and Barbara prefer Marblehead.

Jay has turned a part-time project into a full-time business—he had been running a couple of coin-operated laundromats in his spare time; now he has gone into a full-scale cleaning and laundry operation in Bedford, Mass. . . . **Ara Shrestinian** is with Thompson and Lichtner, Consulting Engineers, in Brookline, Mass. The Shrestinians live in Ballardvale, Mass., and have two boys and a girl. . . . **Daniel von Recklinghausen** is Chief Engineer at H. H. Scott in Maynard, Mass. Now you high-fi buffs know where to get your amplifiers, etc.—**Howard L. Livingston**, Secretary, 358 Emerson Road, Lexington, Mass. 02173; Assistant Secretaries: **Marshall Alper**, 1130 Coronet Avenue, Pasadena, Calif. 91107; **Walter O. Davis**, 346 Forest Avenue, Brockton, Mass. 02401; **Paul G. Smith**, 11 Old Farm Road, North Caldwell, N.J. 07006



Richard E. Chambers, '53

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We have come back from another summer and I hope it has been a pleasant one for all. I was sorry not to have been able to attend the class reunion but understand that it was quite enjoyable, as usual. It is a pleasure to report that one of our class officers, **Richard E. Chambers**, XVII, has been named an Associate Member of the Cambridge, Mass., consulting firm of Simpson Gumpertz and Heger, Inc. Dick was formerly a Senior Staff Engineer working on the development of structural products and materials. His recent projects have included cargo containers, reinforced plastic chemical and gasoline tanks, microwave antennas, fiberboard products, and building components. From 1960 to 1965 he was in the materials research laboratory in the department of Civil Engineering at M.I.T. He lives with his wife, Ann, and four children in



Jerome J. Tiemann, '53

Canton, Mass. Congratulations, Dick! Another metallurgy graduate is moving up. **G. Dixon Chandley**, has been named Vice President for Technology of the Hitchiner Manufacturing Company in Milford, N.H. Prior to this Dix had been Chief Production Metallurgist at the Watertown Arsenal and this assignment was followed by a stay at TRW Metals Division, TRW, Inc., where he was successively Chief Engineer in charge of a Mechanical and Metallurgical Engineering Department and then Technical Director of the organization. Hitchiner is a manufacturer of precision castings. Keep your grains oriented, Dix!

Carl F. W. Wolf, X, was graduated with a degree of Doctor of Medicine from the Hahnemann Medical College and Hospital in Philadelphia, Pa. He will be interning at the New York Hospital-Cornell Medical Center in New York City. Congratulations, Carl. We are again suggesting that all classmates who might be interested in **Ben Coe's** Volunteers for International Technical Assistance contact him at that organization, College Campus, Schnectady, N.Y. 12308. This organization provides a very interesting technical consulting service for underdeveloped countries and should prove extremely interesting for those of us who can find the time to provide simple answers to simple requirements. **James T. Duane**, VI, who has been at General Electric since 1954, has been named General Manager of the newly created speed variator department within the industrial drives division. Jim is a native of Clinton, Mass. **S. William Gouse**, Jr., II, is predicting the return of steam engines in competition with internal gasoline combustion engines. In the June issue of *Engineer*,

Professor Gouse, who is at the Carnegie-Mellon University in Pittsburgh, suggests that the steam engines should compete on an economic basis with the gasoline engine and it would, of course, not pollute the air. He is a special consultant to the U.S. Department of Commerce's panel on electrically powered vehicles. This panel report, known as the Morse Report, said that at this time steam power appears to be a better alternative to the internal combustion engine than does electric power. This is an interesting development and I am sure interested parties might wish to contact Bill Gouse for further details.

Jerome J. Tiemann, VIII, has been appointed Manager of the Photo Engraved Digital Recording Opportunity Program at the General Electric Research and Development Center in Schnectady, N.Y. **Sven Treitel**, XII, has presented a series of lectures in Mexico City at the University of Mexico, on various basic concepts in the geophysical digital processing. Doctor Treitel is a research group supervisor at Pan American Petroleum Corporation which is a wholly owned exportation and producing subsidiary of Standard Oil Company. **Norman Doelling**, VIII, has joined the Digital Equipment Corporation in Maynard, Mass., as Marketing Manager for educational markets. Previously he held positions as sales manager with General Electric and as a divisional vice president for Bolt, Beranek, and Newman, Inc., in Cambridge, Mass. After obtaining a master's degree in electrical engineering in 1955, he completed a Harvard Business School program for management development. Digital Equipment Corporation is a manufacturer of computers, computer components, and related products. **Karl H. Eppe** has been recently promoted to General Manager of the Heli-Coil Products Division of Heli-Coil Corporation, Danbury, Conn. He is active in community affairs and is Vice President of the Community Chest and President of his church congregation in Danbury. **Stanley M. Bloom** is currently Laboratory Manager of Organic Chemistry at Polaroid Corporation in Cambridge, Mass. **Louis G. Kaufman** is pursuing a doctoral program in mathematics at Princeton University. **Harris J. Bixler**, X, is Vice President for Research at Amicon Corporation. This company is an M.I.T. "spin-off" specializing in the development and manufacture of separation equipment and polymer products. Harris still lives in Lexington but now has an old colonial farm in Richmond, N.H., for his relaxing moments. **Marshall F. Merriam** is in Kenpur, India, as a visiting Professor at the Indian Institute of Technology, under the auspices of USAID. This joint Indo-American attempt to create a center of technological education and research in the heart of the Gangetic plain is the largest USAID educational project in the world. Doctor Merriam points out

that it is little like trying to build M.I.T. in the middle of Mississippi. His permanent post, to which he will return in 1969, is Associate Professor of Engineering Sciences at the University of California in Berkeley. . . . The following address changes have been noted: **Donald J. Jongbloed**, I.M.B. Dept. 430, 1701 North Street, Endicott, N.Y. 13760; **Elmer E. Selby, Jr.**, 104 Holiday Drive, Horseheads, N.Y. 14845; **Richard P. MacCarthy**, 58 Summer Street, Marshfield, Mo. 02050; **Richard M. Mandel**, 604 Skokie Lane South, Glencoe, Ill. 60022; Commander **Wharton H. Brooks**, 611 Ridgewood Road, Maplewood, N.J. 07040; Captain **John F. Fagan, Jr.**, 8134 Briar Creek Drive, Annandale, Va. 22003; **Hans Van Gelder**, Headquarters, U.S. EUCOM (J.3) APO N.Y. 09128; **Morris B. Carter**, Union Carbide Corporation, Parma Tech. Center, P.O. Box 6116, Cleveland, Ohio 44101; **George C. Barclay, Jr.**, c/o Mobil Europe Inc., 14 Regent Street, London, S.W. 1, England; **Arthur N. L. Chiu**, 1654 Paula Drive, Honolulu, Hawaii 96816; **Jack B. Flanagan, Jr.**, 32 Duggan Road, Acton, Mass. 01720; **Robert Kay**, 6608 Greentree Road, Bethesda, Md. 20034; **Robert Bart**, 1313 Coddington Avenue, Silver Springs, Md. 20901; **Robert P. Joslin**, 517 South Happy Hollow Boulevard, Omaha, Neb. 68106; **Michael A. Rickards**, 3958 Murietta Avenue, Sherman Oaks, Calif. 91403; **William E. Young, Jr.**, 304 East 42nd Street, New York, N.Y. 10017; **H. Max Davis**, 2396 Barnett Drive, Bellbrook, Ohio 45305; **Kenneth R. Geiling**, R.D. #2, Vista Drive, Sayre, Pa. 18840.—**Norman R. Gardner**, Secretary, Kawecki Chemical Company, 220 East 42nd Street, New York, N.Y. 10017

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George J. Bartolomei has left sunny California and the Aerospace industry to accept a newly created position as Manager of Value Engineering for the Caloric Corporation, a producer of gas ranges and accessories in Topton, Pa. He is also actively assisting Philadelphia's Albert Einstein Medical Center and the local Small Business Community in the application of value engineering techniques to private enterprises. **Hamilton Bowser** has been promoted to Vice President of Engineers, Inc., consulting engineers of Newark, N.J., specializing in industrial and chemical plant design. Mrs. **James W. Brown, Jr.**, writes that she and his six children are "extraordinarily proud" of Jim's recent appointment as Vice President of Sales for the Vistron Division of Standard Oil of Ohio. . . . **Thomas N. Coppedge, Jr.**, is Staff Engineer, System Effectiveness Department at Martin Marietta Corporation's Orlando Division. **George T. Dormer** is presently in the Corporate Finance Department of Bear Stearns and Company on Wall Street in New York City. **Dan Farkas** bumped into **Phil Rane** at a Boston Symphony Concert while

visiting here in April. Dan notes (after seeing Boston Common) that his home state of California no longer has a monopoly on hippies! **Dick Finn** reports two sons, Peter, six, and John, four. Dick is marketing manager at EG and G's Nuclear Instrumentation Division in Salem, Mass. **Mason King**, a Mathematics and Science Teacher since graduation, is teacher-coach at the Acton-Boxborough Regional School in Acton, Mass. . . . A consulting engineering practice in the heating, ventilating and air conditioning field was started by **Theodore Knowles, Jr.**, in 1967. The Knowles (Ted, wife Gini, 1 daughter, and 3 sons) reside in Rochester, N.Y. **Robert Law** reports: "Having a fascinating time doing management consulting for McKinsey and Company in San Francisco." Is it the work or the environment? **George J. Malecki's** Malecki Laboratories, Inc., have moved to larger quarters but we have no idea where. . . . **Decker G. McAllister, Jr.**, proudly announces the arrival of Decker Gordon McAllister, III. Decker, Jr., was General Chairman of the Fifth Annual Technical Meeting of the Southern California Section of the American Institute of Chemical Engineers held at the Statler Hilton Hotel in Los Angeles in April. High points of the meeting were the luncheon address by Congressman Ed Reinecke on "The Role of the Engineer in Community Affairs" and the paper on the "Role Sources and Control of Nitrogen Oxides in Air Pollution," presented by Dr. Max S. Peters, President of the American Institute of Chemical Engineers. Back in the "Good old USA" from Japan, are Major **J. Scott Mudgett**, wife Barbara, Victoria, eight, Felicity, seven, and John-John, six. Scott is teaching Nuclear Weapons Employment at the U.S. Army Chemical Center Aid School. . . . **R. Thomas Peirce, Jr.**, has moved to New Jersey to become marketing Vice President at Pacemaker Corporation, a major manufacturer of power boats. **Oscar W. Sepp** has been appointed a member of the American Institute of Aeronautics and Astronautics Aero Decelerators Committee. His patented parachutes used in conjunction with the F-111 escape module have saved eight lives which "makes four years of ulcers worth it." **Paul W. Stern** has joined the firm of Issacs-Dobbs Systems, Inc., a subsidiary of American International Aluminum, Inc., as a management consultant. Paul and wife Marilyn have a two and a half-year-old daughter, Deborah. Mrs. Frank A. Ubel (**Gix Lavedan**) is now on the Board of Directors of the M.I.T. Alumni Club of the Twin Cities. Mother of three sons and one daughter, she also occasionally tutors in mathematics. . . . **Paul P. Valerio** reports that **Sooren Soovajian** dropped by to say hello from the I.B.M. plant in Kingston, N. Y., and **John Zarcaro** dropped in from Dallas where he was conducting business either with or for Grumman. (This wasn't clear.) They are both doing well in their respective jobs. Paul's structural con-

sulting practice is doing extremely well also. **Benedict R. H. Winslow** recently moved with wife and five children from Indianapolis to Reston, Va. He is now with the Transportation Systems Department of the MITRE Corporation.—**E. David Howes, Jr.**, Secretary, Box 66, Carlisle, Mass. 01741

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This summer has been an unusually active one for us if we can draw any conclusions from the raft of information received concerning promotions and new positions for members of '55. It is always rewarding to note that a Tech grad has put his engineering experience to use in his vocation. **Lester Lee** stresses this particularly in his comment that his M.I.T. background is extremely useful in the purchasing of special machinery and equipment and the formulation of warehouse operations and data processing techniques. He and Ruth live in the Washington, D.C., area and by the time this issue is published will have had a third addition to the family. Les is Vice President and Secretary of Capitol City Liquor Company. . . . On the subject of pleasurable professional activity, **Seabury McGown** has recently moved to Bellingham, Wash., where he is Chief Engineer for Uniflite, Inc., a manufacturer of fiberglass boats. His new home is right on the water and his ten-year-old son, Bill, now has an El Toro dinghy. **Henry Theis** has also caught the sailing bug, and has just bought a half share in a 26 foot cruising sloop named Ariel. Last winter Henry was injured in an ice-boating accident . . . but is all healed now. He lives in Hinsdale, Ill. . . . **George Goeplert** has recently returned to the United States after spending five years in Malaya and Indonesia with affiliates of Esso Eastern Standard, Inc. He is currently serving as Finance and Economic Advisor for Southeast Asia in the Finance and Planning Department at Esso Eastern. While on the subject of the Orient, **John Lair** writes from Pacific Palisades, Calif., that he and his father have started a company called Technissima, which specializes in the engineering science of the Sino-American future. In April, **James Moore**, Lt. Colonel in the U.S. Army, was appointed Commander of the largest PX depot in the world—the Saigon Exchange Depot. Jim has been in the service since 1945 and has served in the U.S., Japan, Germany and Korea. He has received the Army Commendation Medal for meritorious performance of duties at Ft. Lee from 1965-1968. . . . A number of our classmates have achieved prominence in the academic field. I think that we all will be proud that **Fred Hennie** was promoted to the rank of Professor of electrical engineering at M.I.T. in April. **Martin Shooman**, who is Associate Professor of electrical engineering at the Polytechnic Institute of Brooklyn, recently published a paper in the *IEEE Transactions on Reliability*. Marty has done consulting



Lieutenant Colonel James Moore

work for the White Sands Missile Range, R.C.A., N.A.S.A. and the Sperry Gyroscope Company in the fields of controls, systems and reliability. During 1967 and 1968, **Laurence Coffin** was certified by the American board of Surgeons, was appointed Instructor in Thoracic Surgery at Case-Western Reserve University School of Medicine, was made Assistant Thoracic Surgeon at University Hospitals, and Chief of Thoracic Surgery at the Cleveland V.A. Hospital. Larry also became a father for the third time . . . quite a busy year. Reverend **William Nichols** was appointed Assistant Professor of physics at John Carroll University in Ohio in 1967. He is currently doing research on the liquid state by means of ultra-sonic and other scattering effects, especially in critical regions. **Herbert Slotnick** was named Associate Professor of chemistry at Central Connecticut State College, New Britain. **Herbert Hultin** is Associate Professor in the Department of Food Science and Technology at the University of Massachusetts. He recently received the \$1,000 IFT Award for Research for his work with enzymes of animal and plant tissue as they work at the cellular level. The Award is given to recognize outstanding ability in food science research or technology by an investigator 35 years of age or younger. (According to your editors' calculations, Herb just made it.) **George Rubissow** is finishing up his thesis on "Detection of Bubble Formation in Decompression Sickness" for his Ph.D. in biophysics at the Univ. of California, Berkeley. . . . The findings of Explorer 35, one of the many robot satellites of earth, were published in the December 1967 issue of the *Journal of Geophysical Research* by Noram Ness, who is an Explorer 35 Project Scientist at N.A.S.A. Goddard Space Flight Center, Greenbelt, Md.

The Explorer 35 confirmed the belief that the planet earth's moon has almost no magnetic field to shield it from the million-miles-per-hour buffeting of the solar wind. Susan and **Dennis Shapiro** welcomed Rachel Tova in July. They and Alison, two, live in Lincoln. In late June, Dennis presented a paper at the International Conference on Electromagnetic Precision Measurements at Boulder, Colo., on the subject of Loran-C skywave measurements. **Marc Gross** writes that life continues to be beautiful and interesting. He has lectured on patent law before the Practising Law Institute this year and found it fun, after the stage fright had passed. He and Debra toured Israel, Italy, France and Portugal on a combined business-pleasure trip this past year.—Secretaries: **Dell Lanier Venarde** (Mrs. J. H.), 16 South Trail, Wilmington, Del. 19803; **L. Dennis Shapiro**, Aerospace Research, Inc., 130 Lincoln Street, Boston, Mass. 02135

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Lloyd Brace writes that he has left United Shoe Machinery to become one of the founders, Vice President and Treasurer of Information Transfer Corporation which is developing a responsive logic controlled audio visual system for teaching elementary reading. . . . **George Brattin** writes that he has been elected Vice President of Anteus Laboratory Equipment of Mount Vernon, N.Y. The firm specializes in pneumatic regulators and soil mechanics testing equipment. . . . **Warren Briggs** has taken a sabbatical from Harbridge House to teach in Northeastern's school of business. . . . **Pete Calcaterra**, who works for Barry Wright, has co-authored an article entitled "Research on Active Vibration Isolation Techniques for Aircraft Pilot Protection." . . . **Jacob Gubbay** reports that he recently received his first patent, assigned to Singer, on a sewing machine attachment. In addition, he presented a paper, "Material Selection for Noise and Vibration Reduction in Industrial Machinery," at the Design Engineering Conference. . . . **Phil Lieberman** is Associate Professor of Linguistics and Electrical Engineering at the University of Connecticut and is on the scientific staff at Haskins Laboratories in N.Y. . . . **Bill Leitch** has returned to the Boston area to work for International Data Corporation which provides market research information on the computer industry. Bill has spent the past nine years at McGraw-Hill where he was recently Industrial Production Editor. Bill, Betsy and daughter, Elizabeth, are living in Newton. . . . **Dick Mateles** is on a leave of absence from M.I.T. to be a visiting professor of applied microbiology at Hebrew University-Hadassah Medical School in Jerusalem. Dick will supervise the fermentation unit there and will commute back to Cambridge to supervise a Sloan Foundation project at Tech. . . . **Harold McKittrick** reports that he is Chief

Structural Engineer at Perini Corporation. Harold is married and has four children. . . . Last May at the 75th meeting of the Acoustical Society of America in Ottawa, **Emmanuel Papadakis** was awarded the society's biennial award. . . . During April and May at the University of Pennsylvania, **Philip Platzman** of Bell Telephone Laboratories gave a series of lectures on waves in metals. . . . In June Major **Guy Schmidt** graduated from the Army Command and General Staff Course at Ft. Leavenworth. . . . **Wolf Vieth** has left the Chemical Engineering Department at Tech to be head of the department of Chemical-Engineering at Rutgers. . . . More information on **Nick Wise**. He is now part owner of Semi-conductor Circuits Inc., which specializes in power supply manufacture.—Co-Secretaries: **Bruce B. Bredehoft**, 16 Millbrook Road, Westwood, Mass. 02090; **T. Guy Spencer, Jr.**, M.I.T., Room E19-439, Cambridge, Mass. 02139

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July has been a month of visitors here in London. First **Harry** and **Anne Johnson** and their three daughters arrived in England after sailing on the *France*. I took the picture that appears on this page of the five of them as they stood on the balcony of our flat in London. (The dour looking faces don't adequately convey their spirits, I can assure you. In defence of my ability as a photographer, I must comment that Harry's passport photo is even worse than this one.) As I noted in the July issue, Harry and family will be here for 10 months. He will be doing some research into Lloyds, reinsurance in general, and the British Social Security system. Harry received his doctorate in economics from the University of Pennsylvania. He met Anne during M.I.T. days; Anne was at Massachusetts General Hospital. I hope to be reporting more on their activities in the months ahead. They will live just a short distance from us in London.

Betty and I have had two visits in the last six weeks from **Gary Dischel**. The accompanying photograph shows Gary (the bearded one of course), his wife, Carolyn on the left, and my wife Betty on the right. This picture was taken on Gary's second visit when he brought Carolyn with him. As I reported a few months ago, Gary and Carolyn were married in December. Gary is with Hotel Corporation of America and his trips to Europe are in furtherance of his company's expansion plans. Gary told me the very interesting story of the M.I.T. Alumni Fund Telethon that he, **Mal Jones**, **Jim Cunningham**, **Joel Searcy** and **Hugo Liepmann** took part in back in the spring. To seek support for Tech, various members of a class are asked to get together and, at the Fund's expense, call up classmates around the U.S. who have not responded to the Fund drive. I understand that the Class of '57's performance set a record.



Harry Johnson and family in London

They averaged 34 calls per person (60 per cent over the previous high). Other statistics on the effort of the aforementioned group are that it placed 135 calls, completed 77, extracted some form of "hope" from 10 per cent of those reached and accepted only eight refusals to contribute. I think this is a very worthwhile effort and know that all of you join me in a pat-on-the-back for a job well done. If you are asked to participate in a Telethon, I suggest you accept even if only for the reason that Gary mentioned—free chicken sandwiches and cherry cheese pie. Final note on Gary—he and Carolyn have just moved to a new home in the Framingham area and are enjoying greatly communing with nature.

A third visitor in July was **Mal Jones** who stopped in London with Jill and their four-month-old son on their way to Edinburgh, where he was to participate in a computer conference. Unfortunately I was out of town at the time and did not have a chance to chat with him. My wife reports that they are very well.

I traced **Art Aznavorian** to Enschede, Holland. A note to him elicited the following news: "My wife and I have been here for about four months now and we're enjoying the pastoral life in this part of Holland tremendously. We will, in fact, be celebrating our very first wedding anniversary here next month. Susan is the former Susan Ivok of Worcester, Mass., and a graduate of Simmons, Class of 1961. I'm here on about a two-year assignment as technical advisor to Polaroid's film manufacturing plant in Enschede." . . . Betty and I go over to Holland quite often (it is her homeland) and we hope to get together with Art and Susan and gather more news. That's all for a while. Please write when you can.—**Frederick L. Morefield**, Secretary, 18 Whaddon House, William Mews, London, S.W.1.



Carolyn and Gary Dischel, 57 (left), with Betty Morefield (right)

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Would you believe it? I have so much to report that I'll have to spread it out over the next few issues. **Michael Neidich** says: "I live and work on Long Island, N.Y.; am Engineering Sales Manager for the Data Conversion Products Division of Data Device Corporation. Have two children—Jeff, seven and Laurie, five. Would like to hear from old friends c/o D.D.C., 240 Old Country Road, Hicksville, N.Y. 11801." . . . A long letter from **Jim Cobb**: "As I remember, the last time I wrote to you, I had just arrived at the Naval Ordnance Test Station (now Naval Weapons Center) at China Lake, Calif., to begin a twenty-one month tour of duty as an Army First Lieutenant (later as a Captain). During my tour there with the Weather Modification Section of the Earth and Planetary Sciences Division, I helped initiate a warm fog dispersion field experiment at Hollister, Calif. The experiment has recently been moved to Arcada, Calif., and I understand is continuing successfully. For a brief period during my tour at China Lake, I was assigned to assist a team of officers and civilians on a special scientific project conducted in the Republic of Vietnam, for which I received a Navy Commendation Medal. I left active duty in October 1967, and am now working for the Esso Research Laboratory here in Baton Rouge (Chemicals Raw Materials Division). Since our arrival here my wife and I have become the proud parents of a boy (our first child). Just before his birth our household was prematurely disrupted by four wire-haired fox terrier puppies from our registered female—that was a lot of fun! I have recently joined the local sections of the American Institute of Chemical Engineers and the Louisiana Engineering Society. I hope to be active with both when activity begins again this fall." . . . And another nice long letter from **Bruce Layton**:

"This is to bring you up to date on my activities (that is, since graduation day). I pushed a desk calculator for AVCO (Wilmington, Mass.) until September, 1962, when I enlisted under the Air Force Officer Training School program. After attending various technical schools, I got to spend the last three and one-half years on a Titan II missile launch crew. Now the Air Force is sending me to Purdue for my master's degree in industrial engineering. Presumably I'll get some sort of R and D position when I graduate. My address is room 756 Graduate House, West Lafayette, Ind. 47906. I'll be here from one and one-half to two years. The only '60er from whom I've heard lately is **Rudy Marloth** who is working for Hughes Aircraft in Los Angeles. His address is 2001 Malcolm Avenue, Los Angeles; he married in 1963 and now has a family of four children. Keep up the good work. One of these years I'll get a leave that includes Alumni Day. Better yet, I might even learn to type." . . . **Rob Stengel** just received his Ph.D. in aerospace and mechanical sciences from Princeton University. He is now a member of the Research Staff at the M.I.T. Instrumentation Lab, working on the Apollo LM control system. He and Peg are living in Cambridge. Speaking of Cambridge, we have had some visitors to Cambridge this summer. First, Carol and **Chris Witze** dropped in on their way through Boston; they were taking a New England tour vacation. We were able to misdirect them mightily. Chris got his Ph.D. at Berkeley; he's now with Bellcomm, Inc., Systems Engineering in Washington, D.C., and living near Silver Spring, Md. He and Carole both seem to have weathered the years beautifully—they certainly don't look any older than we do. Just a few weeks after the Witze's visit, **Ernie Gudath** appeared in Boston for the first time in about five years. He's now working for the Borden Chemical Company in Plant City, Fla., is married and has a new baby daughter (about three

months). As a matter of fact, Ernie is still here on business and we're joining him for dinner tonight. Life's little triumphs department: **Larry Elman** tells me that "in 1961 I was late to renew my Coop membership as I was in the U.S.A.F. Anyway, I lost my old Coop number. Ever since I have carried on a fight with the HCS to get my old one back. Today I got a letter—effective 1 July my old Coop number of 1956-60 is mine again!"

Sidney Ossakow is an Associate Research Scientist with the Lockheed Research Laboratory in Palo Alto, Calif., working in space plasma physics. He and his wife, Joannie, proudly announce the birth of their first child—Robert Eric, born on May 10, 1968. **Marshall Douglas Nelson**, now a Captain in the U.S.A.F., is assigned to the Computer Communications Directorate of the Air Force Communications Service. **Richard Faber**, who was an Assistant Professor at the University of California at San Diego, is now Assistant Professor of Mathematics at Boston College. . . . **Jarold Abbott** has been elected National President of the William Jewell College Alumni Association for 1968-1969. **Ronald Agronin** says: ". . . still living in Texas. We had another addition to the family—our first girl—Robin Jo. I am presently in charge of process engineering at the Pasadena mill of U.S. Plywood-Champion." **Roger Mark** is: "serving Uncle Sam in the Medical Corps of the U.S. Air Force, stationed at Kirtland A.F.B. in Albuquerque, N.M. in a research slot." He reports that his wife, Dorothy, and daughter, Betsy, (eight months) are enjoying being in New Mexico. . . . Business, business: our noble class President (**E. G. Hurst** in case you've forgotten) was in Cambridge in June. He's with G.E. in Philadelphia, but will join the faculty at Wharton in January. Anyway, while here he announced that the Chairman of the M.I.T. Class of 1960 Tenth Reunion (hurrah!) will be **Thomas H. Farquhar**, 52 Mayo Road, Wellesley, Mass. Tom, who had not prepared for this moment by having on hand a large crowd of classmates who would suggest others for the job, was unable to refuse the honor. So, gang, save whatever weekend in June 1970 it's to be, reserve dog sleds, covered wagons, etc., and plan to head east for the 10th. Any and all who wish to contribute time, talent, effort (or even money) to the affair please call, write or wire either Tom or me. Meanwhile, have a lot of parties and wild times to get in practice.

Did I report that **Chris (Sprague, of course)** got his Ph.D. in Management this June? Well, he did. . . . One last piece of news: **Dick Hornby**, who is on the faculty at Bowdoin College in Brunswick, Maine, was in Boston for part of the summer directing G. B. Shaw's *You Never Can Tell* at the Loeb in Cambridge. Here's a quote from the review which appeared in *Boston After Dark*: "Director Richard Hornby

kept the action flowing, making even the most pedantic of Shaw's speeches move quickly. His most impressive achievement, however, was in maintaining a clearly defined relationship between Mrs. Clandon and her clan. There was never a doubt that these four people were a family—there was an unspoken understanding among them. In a realistic play this is an absolute must; in a comedy of manners, it is an outstanding achievement since most directors and actors concentrate on a 'style' of playing and lose the undercurrent of character." . . . To be continued next month—the life and fun times of the Class of 1960. Send your installment to: **Linda G. Sprague**, 345 Brookline Street, Cambridge, Mass. 02139

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There is a summer's worth of news to be covered this time so let's get to it. **Michael Wiederhold** is an Associate Professor at M.I.T. teaching straight EE and Neurophysiology courses. He's also a Research Associate in (get this, fans) Otolaryngology at Massachusetts Eye and Ear Infirmary. **Harry Rosenzweig** is also teaching. He has been at Haverford College since graduating with a Ph.D. in math from the University of Virginia last year. The Rosenzweigs have three kids, the last born in Oklahoma where they spend summers. **Donald GEORGE Morrison** is "currently doing research on Latin American Education at the University del Valle in Cali, Columbia. Don's namesake, **Donald GRAHAM Morrison** is also at Columbia (Columbia University that is). He writes: "Having survived the student demonstrations at Columbia, we look forward to another interesting year in New York. I have been promoted to Associate Professor in the Graduate School of Business. My wife, Sherie, is a half-time research associate in the biology department and our daughter, Heather, is now two." Speaking of riots brings to mind the fact that **Maynard R. Johnson** works for Dow Chemical. He is an Attorney in the Agricultural, Pharmaceutical and Consumer products Patent Department.

Social Notes: Prof. **A. C. Singhal** met Miss Uma Sharma (M.A.) while teaching at I.I.T. (Bombay) in the summer of 1967. They are married now. **Joel Serkes'** wife Janet produced Sandra Ellen Serkes last April 29. **Paul Hogle** had a second daughter, Pamela Suzanne, on May 17. He still works for Cleveland Metal Abrasives as a plant manager. He reports that **Doug Johnson** is with Merrill Lynch in Cleveland. Another "fat cat" living off the stock market is **Ira Dorf**. He is the Manager of Compensation and Benefits at Francis I. DuPont in N.Y. City. **Herbert Berman** writes: "(1) Senior Engineer-Semi Conductor Technology at Westinghouse Astronuclear Division; 2) Married November '67." . . . A press release from Tinker Air Force Base states that

Dr. (Captain) **William Dyer, Jr.**, is Chief of Aerospace Medicine at McClellan Air Force Base, Calif. **William Nieckarz, Jr.**, is "serving a two year tour of duty in the Army (ROTC Commission). Presently I'm a Captain working as a chemist at the Armed Forces Radio-biology Research Institute in Bethesda, Md." **Edward Hessler** is recently out of the Army. They grabbed him after he got his Ph. and D. from Stanford in Organic Chemistry (January, 1967). Now out, he is in Kalamazoo working for Upjohn, living with a wife and two kids and a sailboat. He says that it's his first real sailing since M.I.T. **Ted Hammack** also is married and also has two kids (girls) but there is no report on boats. He has been working for Shell Development Company for the last two years and living in the San Francisco Bay area. He got an Sc.D. from M.I.T. in Materials Engineering earlier this year. Also out on the West Coast is **Alexander Ross**. He says: "I was married in 1962, to a Wellesley graduate and worked in Hawaii for five years in refinery engineering for Standard Oil Company of California. Then I was transferred to Los Angeles in 1967 and am serving as a lead engineer for Standard at their El Segundo refinery." (Making smog). . . . **Sam Williamson**: "After a postdoctoral year at the Universite de Paris, Orsay, France, I have been 'transplanted' to the Science Center of the North American Rockwell Corporation in Thousand Oaks, Calif., where I'm pursuing very-low temperature experiments in solid state physics. Lovely skiing and surfing!" **Gary Gustafson**: "After receiving my M.B.A. from Northwestern University in 1963, I have begun work here (in Hartford) at Pratt and Whitney Aircraft in the Proposal Planning Group. Several years ago I was promoted to the position of Supervisor of Cost Information Systems—a position which continues to offer an interesting challenge." **James Manganaro**, having gotten a Ph.D. from R.P.I., couldn't tear himself away from the slimy waters of the Mohawk and got a job from G.E. Now he is on the grubby waters of the Hudson teaching at Manhattan College in the Bronx. **Paul Tedrow** received his Ph.D. from Cornell in 1966 but even before the degree was in hand he was working on the Staff of the National Magnet Laboratory at M.I.T. **Hank Schleinitz** is still with DuPont but he is now at their Washington Laboratory in Parkersburg, W. Va.

Last spring I received an anonymous letter listing the activities of some people in the Class and I assume that everything said therein is correct. To wit: "**Jim Francis, Jr.**, has left Medinet Corporation and has been elected Vice President of a new company Agrippa-Ord, Inc., a computer software company. Jim and Celia live with their 8-month-old son, Chris, in a home they purchased last year in South Lincoln, Mass. **David Latham** is currently writing his Ph.D. thesis in astronomy at Harvard hoping for a June,

1968, graduation. Dave is group leader at the Smithsonian Astrophysical Laboratory. He lives with his wife Ginger and three sons in a home they built in Harvard, Mass. Dave was last year's New England Champion in the senior class of enduro motorcycle racing and is one of the top twenty racers in the country in this event. Sidney Magee, Jr., '62, is living in his home town of Greenwich, Conn., with his mother. He is an architect of some repute having had a vacation home he designed and built in Manchester, Vt., featured in the New York Times Magazine Section a few months ago. **William E. Jouris** is a research engineer with the Kendall Square Company, Moleculon Research Corporation. Bill is an avid skier and scuba diver and the Chief Range Officer for the M.I.T. Pistol and Rifle Club. He is currently studying for the certification examination given by the American Board of Health Physics. **Paul Cox, Jr.**, completed his residency at Grady Memorial in Atlanta and is now serving his military obligation as a staff member at the Public Health Service Communicable Diseases Center in Madison Wisc. He was recently the father of a new daughter. **John Arens**, after receiving his Ph.D. in high energy physics from Berkeley, decided space science might be more interesting. He took a post-doctoral at the Goddard Space Flight Center in Greenbelt, Md., where he has been ever since. **John Warren**, at last report, had left his job at Lockheed and is fishing and skiing while casually looking for a more interesting job. He lives with his parents in Oakland, Calif. **James Clayson, Jr.**, is Manager of Operations Research at the Carnation Company in Los Angeles. He has spent a good part of his time out of the country, in Europe or Mexico of late, inspecting Carnation operations. When he's home it is at the small house in Hollywood Hills where he enjoys the bachelor's life and parks the Morgan." Thank you, whoever you are.

A couple of notes came more directly in the last couple of weeks: **Thomas Geers** said that he "received Ph.D. in applied mechanics (Course II) in January, 1967. Since then I have been doing research in acoustics and random vibrations at Lockheed Missiles and Space Research Labs in Palo Alto, Calif. I have just built a home in the foothills of the Santa Cruz Range. San Francisco is a great city." **Ian Clark**: "After spending four years with Honeywell in New York, Minneapolis and Philadelphia, I was transferred home (to Mexico) three years ago and I am currently Factory Manager here. I am presently Secretary of the M.I.T. club of Mexico. I have been married for nine years and have a six-year-old son and a year-old daughter. **Robert Weirich** moved to Washington, D.C., not long ago to work for Booz-Allen Applied Research, Inc., which is a consulting engineering firm. **Carl Karrfalt** says that he "returned to Sanders (in New Hampshire) where I now head a group that specializes in advance computer

design and development. We were away for two years in Rochester, N.Y., and St. Louis. We now have two boys—ages 5 and 2½." A.D. Little sent over a press release stating that they had just grabbed **Byron Willis**. He will specialize in applying systems analysis techniques to solve transportation problems. Byron got his Ph.D. from M.I.T. in Aero. He and his wife, Eugenia, live with their year-old son in Sudbury, Mass.

Last June 9, one **Jerome Grossman** married Barbara Lieb in Maplewood, N.J. They waited almost a week and then took off for Europe. In the entourage at the wedding were **Dave Ness**, **Pete Gray**, **Chris Sprague**, '60, and **Dave Jablo**, '62.

By a strange irony, as I write this, I have received in the mail the column I wrote after the death of Martin Luther King, and I am reading in the papers of the death of Robert Kennedy. Do you have any thoughts on these events? Perhaps you would tell the class about them. I'll try to get them published.—**Andrew Braun**, 131 Freeman Street, Brookline, Mass. 02146

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Joseph R. Bloomer completed medical training at Western Reserve University in 1966, served internship and residency at the University of California hospitals in San Francisco, and will now spend the next two years at the National Institution of Health in Bethesda, Md. He is married to Anne Macintyre. . . . **Mr. Joseph Horowitz** received his Ph.D. in math from the University of Michigan in Dec., 1967. . . . Professor **Denis M. Jesson** returned to Canada in 1966, and is teaching at the University of Manitoba, has his own practice, and expected a fifth child in April. . . . **Peter P. Goldstein** returned to Boston from New Zealand where he was employed by the Ministry of Works and is now employed by Digital Equipment Corporation and has a position in the sales department in PDP-9 sales support. . . . Roger Rowe is attending the Harvard Business School. He expects to receive his M.B.A. in 1969. . . . A new method that helps Government scientists spot filth in foods is examined in the February issue of *F.D.A. Papers*, the official publication of the Food and Drug Administration. Developed by F.D.A. food technologist **Richard Stein**, the process utilizes a blue-green dye that detects insect and other forms of filth in foods. Illustrations show how the process discloses such contaminants as flour beetle wings found in cocoa and fruit flies in cucumber relish. . . . **Robert L. Powell** recently joined the Du Pont Company's Plastics Department Research and Development Division at the Experimental Station Lab near Wilmington. After receipt of his master's degree in chemical engineering from Syracuse University in 1964, Mr. Powell attended the University of Rochester, where he completed the requirements for his

doctorate in chemical engineering in December, 1967.

Albert M. Bottoms has been named director of an Operations Research Task Force working for the Chicago Police Department. The project intends to apply the techniques of operations research to police department operations. The twenty-one-month project is funded by the Department of Justice—Office of Law Enforcement Assistance, and is an outgrowth of suggestions contained in the Science and Technology Report to the President's Crime Commission. This information is given us by David G. Olson, '63, who joined Mr. Bottoms in Chicago. . . . The following paper was presented at the November, 1967 Federal Aviation Administration Maintenance Symposium—"Optimal Vehicle Control for the Merging Problem" by M. Athans and **W. S. Levine** for the Department of Transportation. The paper is on theory of optimal control used to analyze the problem of high-speed vehicles merging from guideways into one guideway. **Alvin Feingold** received his Ph.D. from Cornell University in 1967, in materials science and engineering and is now at E.I. DuPont de Nemours and Co., at Wilmington, Del. . . . **Marshall H. Kaplan** should have graduated June, 1968, from Stanford University with a Ph.D. in aeronautics and astronautics. He will go to Penn State University this September as Assistant Professor of Aerospace Engineering. . . . **Jerry L. Adams** is now an Assistant Professor in the physics department at Ohio University. . . . **Joseph V. Iemolo**, Data Sales Manager with Bell of Pennsylvania, and wife Judy, became the proud parents of their first child, a son, David, born on November 24, 1967. Mr. Iemolo received the "Gold Telephone Award" from the Greater Philadelphia Chamber of Commerce in December, 1967, for selling over 30 corporate memberships into the Chamber of Commerce. Nice promotion. . . . **Joseph Perkell** sends word that **Paul Olmstead** is completing his master's degree in business at Harvard this June. He and his wife, Carol, and their baby daughter are living in Boston. Along with that news he reports that **Richard Rossman** is working for Maleculon Research Corporation in Cambridge as a research engineer, and has been instrumental in the successful completion of several classified projects in the field of radiation dosimetry. Dick and his wife and two children have a home in Milton, Mass., which serves as a base of operations for Dick's growing coin dealership. . . . **Bojey Salmon** reports that since his termination with Bethlehem Steel in January of this year, he has moved to the field of electronic data processing with Honeywell EDP in Chicago in the vicinity of O'Hare Field. He expected to graduate from Northwestern in June with an M.B.A. in marketing, with the theme for his M.B.A. paper of marketing management on golf course and real estate development. . . . **Stanley Harrison** of Bedford, Mass., has been awarded a patent for a lens which will permit



Stanley Harrison, '62

Ion Physics Corporation to produce transistors and other semiconductor devices by "writing" them with an ion beam. A group leader in the firm's Solid State Division, Harrison has designed an improved electrostatic quadropole lens which focuses down the beam to an extremely fine resolution and makes possible the exact controls required for semiconductor production. This advance has come after several years research and presentation of technical papers in the field. Harrison joined Ion Physics in 1962, following graduation from M.I.T. with a B.S. in aeronautical engineering. He also received the University's Admiral Luis de Florez Award for outstanding ingenuity. . . . Hope that the summer and vacations have been enjoyable for all. —**Gerald L. Katell**, Secretary, 310 Hoge Building, Seattle, Wash. 98104

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June 7 and 8 were warm and clear on Martha's Vineyard. The Class was there, 80 strong, and if you ask you will hear of ferries and outboards, banquets and beach parties, wives and friends. . . . The weekend began with a ferry from Woods Hole and most made the last one Friday night. (**Mike Platt**, however, later received an award for missing the boat.) . . . The lounge was open, it was difficult to buy yourself a drink but there was no shortage of classmates willing to accept hospitality when offered.

Saturday began with a breakfast buffet (mercifully served until 11 a.m.) followed by a salt-spray filled outboard trip to a distant beach. There one found warm sand, boxed lunches and beer, volleyball, early June ocean for the hardier, and sunburn. Oh was there sunburn! **Ken Andersen's** burn was judged the most outstanding, but everyone was a runner up. . . . Saturday night featured a

banquet-business meeting, followed by a dance. The class imported a Go-Go girl for the occasion. We batchelors who feel authoritative on the subject declared her "the best we had seen."

Sunday featured the swimming pool, shuffle board, sailing in the harbor, lots of sunburn lotions, and an excellent seafood buffet. The farewells were reluctant, and everyone was planning for June of 1973. . . . The Reunion Committee was headed by **Pete Van Aken** and included **Woody Bowman**, **Jim Champy**, **Al Clark**, **Steve Kaufman**, **Mike Lifschitz**, and **Steve Swerling**. They did an outstanding job. . . . The business meeting was chaired by Class President, **Woody Bowman**. Included were awards, a couple of which have been previously noted. In addition, **Dan Shelley** travelling from San Juan, Puerto Rico, earned the greatest distance prize. **Ken Groninger** was declared least eligible batchelor primarily due to the presence of his fiancée **Vicki**. **Frank Model** came out on top in the least hair contest.

There were several committee reports. The Class Gift Committee displayed an exquisite silver coffee service purchased for the Student Center, with funds contributed by the Class at graduation. The gift fills a need pointed to by the late **James Murphy**, then responsible for the Student Center, and was dedicated to his memory. Former President **Stratton** received the gift for the Institute at the Student Center the week following the Reunion.

The Class of '63 Loan Fund has grown to \$13,092 and is receiving heavy use. The efforts of our Class and others in making loans available as well as Government loan programs are fulfilling present needs. Thus it was decided that our undesignated gifts will no longer automatically go to the Class of '63 Loan Fund, but will be added to the general Alumni Fund. Contributors may continue to support the Class of '63 Loan Fund or any of the other special funds such as the **Julia Fascett Foundation** or the **Independent Living Group Fund** by so designating their gifts. The Class Treasurer, **Stephen Kaufman**, reported a balance of \$200.56. . . . The final order of business was the report of the Nominating Committee consisting of **Steven Colburn**, **James Evans** and **Thomas Garrity**. The Committee nominated **James Champy** for President, **Steve Kaufman** for Vice President, **Stephen Swerling** for Treasurer and **Martin Schrage** for Secretary. Following cries of "railroad" from the rear, **Bowman** requested additional nominations from the floor. There were none. The slate was then unanimously elected for five-year terms. As your new Secretary, I am looking forward to hearing from you and assembling your reports for *Technology Review*. So beginning in the next issue—"the deluge of doctorate" as well as results of the Class questionnaire. If you wish to be included, mail your whereabouts and doings to me or one of the following

Regional Reporters who will enjoy hearing from you even if you have no news. If anyone is interested in covering an area not included, please contact me and your address will be published at the next opportunity.—**Martin Schrage**, Secretary, c/o E.G. and G., Inc., Crosby Drive, Bedford, Mass. 01730; **Michael Bertin**, Regional Reporter, Department of Physics, Stanford University, Palo Alto, Calif. 94301; **Henry Bowman**, Chicago Regional Reporter, Federal Reserve Bank, 230 S. La Salle Street, Chicago, Ill. 60604; **M. Lifschitz**, Washington, D.C. Regional Reporter, National Institute of Health, 5333 Woodward Avenue, Bethesda, Md. 20014

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As the summer comes to an end, I find myself with a few six-month-old clippings and a recent batch of notes from Alumni Fund envelopes. As always, all direct letters will receive priority and will be published in the next available issue. The deadline for this column is about six weeks before publication, so that, for example, news for the January issue must reach me before mid-November. And now for the news: **Tom Arnold** is working on his Ph.D. in electrical engineering at Columbia, and is also on the technical staff at Bell Laboratories. His wife **Carol** is a medical technologist. . . . **Jacques Bojin** is an Assistant Representative for the First National Bank of Boston.

Steven Bollt is President of Computer Systems Development Corporation, a computer leasing firm based in Washington D.C. and Philadelphia, which he formed in February of this year. . . . **Douglas Browne** received his Ph.D. in chemistry from the University of Illinois this June, and is now an N.I.H. Research Associate at Harvard. . . . **R. C. Buchanan**, Sc.D., is a Staff Engineer with I.B.M. and the author of a recent article in the field of glass technology. . . . **Robert Campbell** was recently promoted to Captain in the Army. He is a guided missile staff officer at Stewart Air Force Base. Robert and his wife **Catherine** have a son and live in Newburgh, N.Y. . . . **Thomas Cheek** left the M.I.T. Electronics Systems Laboratory in March to become one of the three founders of Computer Displays, Inc., a corporation making in-out terminals for computers. Tom now lives in Watertown, Mass., with his wife **Susan**. . . . **Mike Coleman** received his Ph.D. in computer science from Carnegie-Mellon University this summer, and is now a First Lieutenant in the Army. . . . **Robert Colvin** graduated from Harvard Medical School this June, and is now a surgical intern at Massachusetts General Hospital. He has been married to the former **Gay Wise** since July of 1966. . . . **Peter Cooperberg** also became an M.D. this June, after graduating from McGill University. Pete is now interning in medicine at the Royal Victoria Hospital in Montreal. . . . **Robert Eyestone** received his Ph.D. from

Stanford in June of 1967, and has been an Assistant Professor of Political Science at the University of Minnesota.

Leonard Gage is now in his second year of postdoctoral work in the Department of Embryology, after receiving his Ph.D. in biophysics at the University of Chicago. He plans to work at the Carnegie Institution of Washington beginning in August of 1969. . . . **Jon Gruber** is working for Booz-Allen as a Consultant on International Trade. He was married in September of 1967, to the former **Linda Wyatt** of Wellesley, '66. . . . **Wayne Hamann** has been recently promoted to Supervisor of the computer application section at Ford. He is the father of two children, ages one and two. . . . **Verne Jacobs** received his Ph.D. in physics at Berkeley and is now on a postdoctoral fellowship at the Weizmann Institute in Israel. . . . **Richard Kline** is working on his Sc.D. in chemical engineering at M.I.T., while his wife watches over their second child born this February. Their first child is also an M.I.T. student (Westgate Nursery School). . . . **Robert Lenox** was married May 25, to the former **Barbara Selig**, University of Massachusetts, '66. Robert graduated from the University of Vermont Medical School and is practicing in Lexington, Ky. . . . **Jerry Luebbers**, our class Vice President, is in the corporate department of New Court Securities in the Big City. The firm was formed by five European banks to handle their investments in the U.S. The Board of Directors includes several Rothschilds and other big names in the world of finance. . . . **Cary Mack** is an industrial sales engineer for Westinghouse.

Robert Morse, '63, graduated from Harvard Law School in 1967, and is now practicing patent law with the firm of **Kenyon and Kenyon** in N.Y. City. He married the former **Sandra Goldstern** in July of 1967. . . . **Edward Olsen** is working on his Ph.D. in astronomy and carrying on research in radio astronomy. He wants to know if W.T.B.S. still advertises "apple gunkies" and "puffed grass." Any answers?

Mrs. Marcia Root had her second son this May. She hopes to be contributing to air pollution control by the time this is published. . . . **Taylor Stem, Jr.**, S.M., is an Air Force Major and recently graduated from the Armed Forces Staff College in Va. . . . **Don Stewart** is serving at the Navy Mine Laboratory in Panama City, Fla. His first child was born in April of this year. . . . **Bruce Stevens** was married August 17, to the former **Gail Bracegirdle** in Langhorne, Pa. . . . **Vincent Taylor**, Ph.D., is the Program Manager for Health Research at the Rand Corporation. . . . **Lee Veneklasen** is in grad school at Cornell. . . . **David Wachsmen** is a Management Consultant with Peat, Marwick, Mitchell and Company in Newark, N.J. That's all the news for now. Let me hear from you.—**Ron Gilman**, Secretary, 1021 Oakmont Place Apt. 8, Memphis, Tenn. 38107

Over the past few months I have received considerable material from members of the Class of 1967. I don't think I will be able to include everything in this month's news, so please excuse the delay. . . . **Charles Gliniewicz** is married to the former Miriam B. Kelleher, a graduate of Regis College, and is now employed as a teacher for the city of Quincy, Mass. . . . **James Puls** has been studying at the University of Arizona. . . . **Chuck Hottinger** has received his M.S. degree and is now working with Sandia Corporation of Livermore, Calif. . . . **Stuart Schaffner** is a programmer for IBM in Poughkeepsie, N. Y. . . . On June 30, **John Schwarz** married Nancy Nirenstein, Simmons College Class of 1969. He worked this summer at Sloan-Kettering Institute for Cancer Research, Rye, N.Y. He is attending the U.C.L.A. Medical School. . . . Last year **Richard Weiner** worked for his masters at the Moore School of Electrical Engineering at the University of Pennsylvania. . . . **Bill Klecan** works for IBM in Poughkeepsie and is active in outing and sports car clubs.

Doug Benson and his wife Marylyn are the proud parents of their first child, a little girl. Appropriately, Doug is trying to form a small toy company. . . . **Mark Magnussen** is presently assigned by the U.S. Army Corps of Engineers as a Research Associate at University of California's Lawrence Radiation Laboratory. . . . Last December **Jerome Milch** married Anita Polk of New York. He has been studying political science at M.I.T. . . . **Richard Pikul** has a baby girl, Jennifer Eileen, born April 22, 1968. He is a structural engineer with Nichols, Norton, and Zalastani, Inc., of Boston. . . . Last year **Guillermo Arnaud** had a teaching assistantship at R.P.I. . . . **G. J. Reichenbacher** recently joined Brookhaven National Labs as a development engineer. . . . Since September **Robin Buxton** has been a Teaching Assistant in the Center for Research in Experimental Space Science at York University in Toronto. . . . **Bill Murray** received his M.S. in physics last April from the University of Michigan and worked at the Lincoln Laboratory during the summer. Bill plans to continue at Michigan where he has received a resident tutorship in addition to a teaching fellowship. . . . **Charles Daney** studied last year in the political science department at Yale University. He is employed with the United Aircraft Research Laboratories in East Hartford, Conn. . . . **Andy Lemer** received his S.M. in Civil Engineering from M.I.T.

Daniel Seeley recently married the former Miss Odile Marie Christine Frank in Courban, France. . . . **Hendon Johnston** is enrolled in the D.B.A. program at the Harvard Business School. . . . **Ed Eisenman** married the former Miss Barbara Crystal on July 2, 1967, in the M.I.T. Chapel with Rabbi Herman

Pollack of M.I.T. Hillel officiating. Barbara graduated from Boston School of Occupational Therapy of Tufts University in January of 1968. Ed is a graduate student in the Department of Zoology at Berkeley. . . . **Don Davis** married Jean Grosz of Boston College in August. He is working for his Ph.D. at Stanford with a teaching assistantship in mathematics. . . . Since March, **Rasiklal Shah** has been associated with Research Development Center of General Electric, Schenectady, as a Fluid Controls Engineer. . . . **John Macrae** is attending the Harvard Business School. . . . **Anthony Fiorentini** has been working as a cost engineer at the Quincy Division of General Dynamics. On November 25, 1967, he married the former Suzan Barrows, formerly a student at Deaconess Hospital.

Lawrence Burgess worked for Raytheon Company in Bedford during the summer; he has now returned to M.I.T. as a Teaching Assistant. . . . **Robert De Bonte** is studying at Purdue for both his Masters and Ph.D. in physics. . . . **Raymond Giglio** has been living with five other Sig Eps in Auburndale while working for AVCO Missile Systems in Wilmington, Mass. . . . **Gregg Heacock** is working for Boeing, on the Business Management Systems Team for 747 aircraft manufacturing. Gregg and his wife Carla are managing a Seattle apartment building.

Rod Peterson is presently building big ships with the Newport News Shipbuilding and Dry Dock Company as a staff supervisor in the Hull Outfitting Division. His primary responsibility is to coordinate a testing program for a series of five Navy ships. . . . **Steve Schroeder** is training for the Air National Guard. . . . **Brad Cross** is with Gulf General Atomic in San Diego.—**Jim Swanson**, 1816 First Avenue North, Grand Forks, North Dakota, 58201

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As I mentioned in the last issue Gail and I are both back at M.I.T. now. We spent our honeymoon in St. Thomas and I would heartily recommend the Virgin Islands for anyone planning such a trip. We even met a lady down there whose husband had gone to M.I.T., and learned from her about the activities of the M.I.T. Club in Puerto Rico. . . . I received a letter from **Ken Rosenberg** telling about what a couple of his friends are doing this year. Ken narrowly escaped the draft just after graduation and is now in Penn Law School. . . . **Howy Ostroff** is at Northwestern studying transportation systems.

Dave Swedlow is now married to the former Ruth Jacoby and is at Harvard Medical School. . . . **Jeff Tranen** was married to Jane Begansky and is back at M.I.T. . . . Barbara Forester caught **Jeff Silverman** and he is now working with Walston and Company, a Boston brokerage firm. . . . **Ric Klass** is in



Second Lieutenant J. C. McPherson, '68, was named a distinguished military graduate of M.I.T.'s R.O.T.C. He elected to take his commission in regular army and will report for active duty to Fort Bragg, N.C., March 1, 1969.

California working with McDonnell Douglas. He was recently married to the former Karen Wise. . . . The last male member of our Class whose marriage I know about is **Rusty Silverman**, who was married to Debbie Minsky. He will be working in Waltham for I.B.M. . . . As for the female members of our Class, **Lynn Wiesenberger** graduated in January and was married to Robert Bruneau, '67. Bob is doing graduate work at Penn State in mineral economics and Lynn is working there as a programmer. Their address is RD 1, Port Matilda, Pa. 16870

Les Kramer is planning to get an S.M. from M.I.T. in September. . . . **Paul Bente** received a B.A. degree from Oberlin. . . . **Pete Bradish** is now working for I.B.M. at Cape Kennedy. . . . **Richard Coppola** is also working at I.B.M. but at Washington, D.C. . . . **Steve Beisner** is now in graduate school at University of Illinois. . . . **Robert Phair** has chosen to go to grad school at Northwestern. . . . A few items about people who received graduate degrees in June. **James Nash-Webber**, Sc.D., was married to Bonnie Gerzog, '67, and they plan to reside in Capetown, South Africa. . . . **Steven Malkin**, Sc.D., is now Assistant Professor of Mechanical Engineering at the University of Texas in Austin. . . . **Gilbert Cooper**, now working at the Lawrence Radiation Lab, Livermore, announces the birth of a son, Kevin, on April 11, 1968. . . . That's all we've heard recently. Please drop us a line about what you're doing and we'll put it in as soon as possible. Secretaries—**Gail** and **Mike Marcus**, 61 Wadsworth St., 4H, Cambridge, Mass. 02139

Course Review

VI

Alan R. Adolph, S.M.'57, has been chosen by the Boston Jaycees as one of the 10 outstanding young men of 1968. Dr. Adolph joined the Department of Retina Research at the Retina Foundation in Boston in 1964, following his doctorate in neurophysiology from Rockefeller University in 1963. He has studied in depth the cells and nerve fibers of the retina and has recently organized a laboratory of neurophysiology to study the electrical and chemical processes involved in vision. His contributions will advance the understanding, curing and prevention of some of the now incurable blinding eye diseases. He has lectured abroad and has published several significant papers. . . . **Ladislav Dolansky**, S.M.'49, E.E.'52, and family have had an interesting August visit in Japan where he presented a paper entitled "Pitch Extraction and Display for the Deaf" at the Sixth International Congress on Acoustics in Tokyo. He also attended the International Symposium on Speech Communication August 29 and 30, in Kyoto. He is Professor of electrical engineering at Northeastern University where he conducts graduate studies and research in speech communication, weather radar, and complex systems. A part of his research is financed by a grant from the Vocational Rehabilitation Administration of the U.S. Department of Health, Education and Welfare and deals with the visual display of speech pitch and inflection. He and his family spent a sabbatical year in 1966-1967 at the Royal Institute of Technology in Stockholm, Sweden. Having come to the United States in 1947 from Czechoslovakia, he and his wife Marie have taken a prominent part in the social activities of the Czechoslovak community of Greater Boston. They can justly be proud of their native land as Boston and all of America commemorate the fiftieth anniversary of the independence of Czechoslovakia during October, culminating in a great cultural evening and banquet on October 27, at Boston's Harvard Club. Professor Dolansky received the Ph.D. degree in applied physics from Harvard University in 1959.

Hiroya Fujisaki, S.M.'59, Associate Pro-

fessor of Electronic Engineering at the University of Tokyo, is in charge of the Electrical Division of the University's Engineering Research Institute. His special research interests are speech analysis, synthesis, perception and coding, pattern recognition, and digital communication systems. Following his research in speech communication at M.I.T.'s Research Laboratory of Electronics, he spent a period of research at the Speech Transmission Laboratory of the Royal Institute of Technology in Stockholm, Sweden. He received the Ph.D. degree in 1962 from the University of Tokyo. . . . **Kenneth W. Goff**, S.M.'52, Sc.D.'54, attended the Sixth Annual Computer Personnel Conference held at M.I.T. in June. He recently became Technical Manager of Leeds and Northrop's Digital Equipment Division, having been formerly Head of the Systems Analysis Section. He presented a paper on the hybrid computer simulation of industrial process control systems in September, 1967, at the A.I.C.A. conference in Lausanne, Switzerland. Following his doctoral study he was employed at Bolt, Beranek and Newman until October, 1956, when he joined the Gruen Precision Laboratories in Cincinnati. . . . **Elias P. Gyftopoulos**, Sc.D.'58, has been elevated to Fellow of the American Nuclear Society. He is a member of the Board of Directors and Vice Chairman of the Aerospace Division of the Society. The news release states, "Gyftopoulos is Professor of Nuclear Engineering at M.I.T. and is one of the world's foremost authorities on the dynamics of nuclear reactors. He has also made important contributions to the understanding of plasmas which may help us achieve direct conversion of heat to electricity." He was U.S. delegate, Third International Conference on Peaceful Uses of Atomic Energy, Geneva, 1964. Professor Gyftopoulos is Acting Head of M.I.T.'s Department of Nuclear Engineering and is writing an extensive graduate-level text on thermionic energy conversion.

Thomas Burke Hayes, S.M.'40, is Projects Manager of the Electrical Section and Head of Business Development of the engineering and planning firm of Cornell, Howland, Hayes and Merryfield (CH₂M, Inc.) of Corvallis, Ore. This firm

grew out of close friendships among classmates Cornell, Howland and Hayes at Oregon State University where Merryfield was Professor of civil engineering. Following their graduation in 1938, the classmates all went into military service and studied for graduate degrees, Cornell at Yale and Hayes and Howland (Course I, S.M.'39) at M.I.T. The firm was born in 1946 and has grown to an organization of more than 270 persons, largest in the Pacific Northwest, offering complete engineering services in civil, mechanical, electrical and chemical fields and a comprehensive planning service including urban and regional planning, economic investigations and resource studies. In 1962, Burke Hayes was appointed by Governor Mark Hatfield to the advisory committee to study the engineering ramifications of the Bonneville Power Administration's proposed California intertie. Innovative concepts and devices have led to the formation of manufacturing subsidiaries to CH₂M in order to make the developments generally available to other firms. **Thomas Kailath**, S.M.'59, Sc.D.'61, became Professor of Electrical Engineering at Stanford University September 1, 1968, having been Associate Professor during the past five years. He shared with J. Pieter M. Schalkwijk the 1967 I.E.E.E. Information Theory Group Paper Award for their joint paper entitled "A Coding Scheme for Additive Noise Channels with Feedback—Part I: No Bandwidth Constraint." Dr. Kailath and his family expect to go to Bangalore, India for the year 1969-1970 to spend his sabbatical year with the Indian Institute of Science. . . . **George H. Kunstadt**, S.M.'49, has been elected President of Alpha Data, Inc., a new company in Tarzana, Calif., to be active in development and production of data handling and storage devices. A combination of advanced engineering developments and proprietary manufacturing processes will enable the new firm to offer to the computer and data processing industry several new high quality memory products at economy prices. A model, now in production at the Tarzana plant, is unique in that it provides a storage capacity of over four million flux reversals, a dynamically balanced drive system, and highest reliability features such as environmental control and

automatic head lifters, all at a minimum cost. Mr. Kunstadt was a *magna cum laude* graduate of City College of the City University of New York in 1944, entering M.I.T. in 1947 after service in the United States Army. He brings extensive industrial experience to his new position, having held managerial positions in Raytheon, Martin-Marietta, and the Radio Corporation of America. . . . **John G. Proakis**, S.M.'61, is on the staff of the Communication Systems Laboratories of Sylvania Electronic Systems, Waltham. His immediate research problem is to increase the speed of digital transmission over telephone lines and radio channels through the application of adaptive equalization techniques. His undergraduate work was done at the University of Cincinnati, the pioneer institution in co-operative education. He held a research assistantship in the Electronic Systems Laboratory while studying at M.I.T. and then became a Staff Member at Lincoln Laboratory. He entered upon doctoral studies at Harvard University in 1963, where he did teaching and research under Professor Donald W. Tufts (Course VI, Sc.D.'60) and received the Ph.D. degree in 1966. He married Miss Felia Themeles in January 1968.

Joseph Watson, S.M.'55, was Visiting Associate Professor in electrical engineering in 1967-1968 at the Davis campus of the University of California, on leave from the Faculty of the University of Wales, Swansea, U.K. In 1966 he published a book, *Semiconductor Circuit Design*, which presented electric circuit concepts from the design rather than the analytical point of view. Having done his undergraduate work at the University of Nottingham, England, he returned there and received the Ph.D. degree in 1958 after his year at M.I.T. where he was King George VI Fellow. . . . **Thomas R. Weschler**, S.M.'46, Rear Admiral in the United States Navy, is Program Coordinator for the Navy's DX-DXG program.

Gun-carrying (DX) and missile-carrying (DXG) destroyers are needed in significant numbers and a plan of procurement is now under way which enlists the ingenuity and co-operation of the shipbuilding industry to supplement the Navy's expertise in the design and production of these ships. In phase A of the program, several companies prepared proposals describing their understanding of the technical problem and their management set-up for production. Phase B is underway in the summer and fall of 1968 and involves the preparation of firm proposals for conducting the development and production phase. Phase C involves the study of the proposals by the government and the selection of the one contractor to carry out the remaining development, design and production of the ships. Admiral Weschler has served on fighting ships in World War II, the Korean War, and the present Vietnam War. He has many decorations, including the Navy Commendation Medal for his work in the development of the Polaris missile system.—

Karl L. Wildes, Correspondent, Room 4-232, M.I.T., Cambridge, Mass. 02139

XVI

In my letter to all graduate alumni of Course XVI, I said: "We hope to have a good response from you." The response was not only good, it was overwhelming. You snowed me under. Now, however, with a new school and *Review* year ahead, I have made a firm resolve to dig out. Herewith, except for a single start a year ago, is the first evidence of adherence to that resolve. I'll start with replies as they were received, and hope there haven't been too many changes in the interim. If there have been, check me on them. . . . **Frank McKone**, '17, spent a year at the Institute in a class with Edgar Gorrell, Thomas Blakemore, and three others. He was particularly interested to know about Professors Miller and Riley. Professor Miller died many years ago, but Professor Riley, at the age of 90 plus, is as active and alert as ever. He never misses an Emeritus luncheon. Commander **Theodore Hechler, Jr.**, U.S.N. (retired) was with the Navy group studying under Doc Draper at the Instrumentation Lab in 1946 and 1947. Commander Hechler was an aeronautical engineering specialist in the Navy and worked with guided missiles and missile test ranges. After retirement in 1960, he went with G.E.'s Missile and Space Division for three years, then came to Washington with N.A.S.A. where he is associated with the Apollo Program. This put him right back in company with the Instrumentation Lab again.

Keith B. McCutcheon, was one of nine Navy and Marine Corps officers who took a special course in jet propulsion in 1943 and 1944. He is now a Major General at Marine Corps Headquarters in Washington. Another Washingtonian is Commander **Milton Gussow**, S.M.'57. He is an Ordnance Planning Officer at Headquarters, Naval Material Command. A year or two ago he completed a tour at the Office of Naval Research where he was re-exposed to inertial guidance and navigation. Mickey also has other interests, including teaching courses in operations research at American University. A busy man. . . . Commander **Thomas J. Kilcline**, '56, was at sea when he replied to my letter. At that time he was on the U.S.S. Forrestal, home base in Florida, as commanding officer of Reconnaissance Attack Squadron 11 (RVAH-11) flying the North American Vigilante, the TA5C. He says his M.I.T. education was most useful during his tour as test pilot and program manager at the Naval Air Test Center. . . . If it should seem that all our graduate alumni are in the services, we also had a great many replies from civilians. **Edward R. Dytko**, '47, is a Senior Project Engineer in the Technical and Research Organization of Pratt & Whitney. **William R. Greenwood**, '54, is a Principal Engineer with Raytheon's Missile Systems Division in

Bedford, Mass. **George A. Reed**, '47, is President of the Oxford Corporation in Buffalo, N. Y. With Grumman out on Long Island, N.Y., is **Richard E. Portnoy**, '61. He is Group Leader—LM Project in the Guidance and Control Department, and is a married man with three children.

George A. Whiteside, '46, has retired from the Navy but not the sea. "I am employed by North American Aviation, Inc., and try to repay them by being a Program Manager in their new Ocean Systems Operation Division. At the present time, I am heading up our team to propose on the DSSV in the upcoming competition from the Navy's Deep Submergence Systems Project Office. Previously I have been Program Manager of our efforts in other underwater weapons areas." Working with him on the DSSV project is **Edward P. Coleman**, U.S.N. (retired), '53. "Ned and I are quite seriously outnumbered here in Ocean Systems by graduates of Course XIV, but we are gaining the upper hand and upholding the honor of the Instrumentation Lab at every turn. We will make them do a proper systems engineering analysis someday." It's good to know the Instrumentation Lab flag flies high out in Anaheim. . . . George had word of **Frank Ralston**, '46, who is at the Autonetics Division as Assistant Chief Engineer of the Minuteman II Program Division. Also of **William G. Fort**, '52, ex-Air Force and ex-North American Aviation. He made a rather complete switch, and is now a highly successful New York Life agent and a founder of a fledgling bank system in Fullerton "which appears to be off to a good start." . . . A former Navy flier, Captain **Ezra M. Ellis**, U.S.N. (retired), '33, is now in Florida instructing at the St. Petersburg Junior College in mechanical courses. "All the dippy-does in mechanics are in my area!" **Robert Lowery**, after a year as Chief Scientist for the Air Force, returned to the University of Rochester as Professor of mechanical and aerospace sciences.

A formal "To: From:" memo arrival from **Randall T. Boyd, Jr.**: "I graduated from the U.S. Naval Academy in 1941, obtained my S.M. degree from M.I.T. in 1947, and retired from the Navy in 1961. Not straying too far from the Institute finds me presently located M.I.T. Instrumentation Laboratory (IL11-114) on the Apollo Program." In fact, his office has, until recently, been right across the hall from mine. . . . **Hamilton O. Hauck**, '46, said he'd be happy to send information but he wasn't sure what kind of information was wanted. Well, his letter head supplied one important item. He is President of Infrared Industries, Inc., of Santa Barbara, Calif. Other items of interest would include just what Infrared Industries produces. . . . At the Naval Academy is Commander **John W. Johnston**, '55. He reported there in July, 1966, and is the Executive Officer of the Science Department. That's quite a department as might be expected, 105 civilians and officers teaching 71 courses in chemistry,

physics, and electrical sciences. As a flier in Heavy Attack Squadrons, Johnston has had a varied career. He has been in the Mediterranean on the USS Forrestal, in the western Pacific aboard the USS Constellation, and in the South China Sea on the USS Oriskany. In between were other tours at the Naval War College and the Naval Ordnance Test Station in the Mojave Desert. No doubt Mrs. Johnston and their two daughters, Mary Carole and Francie, are happy to see him get a more sedentary assignment at Annapolis.

Major **Donald J. Kutyna**, '65, graduated from the Aerospace Research Pilot School in September, 1966, and then became an instructor in that school. In addition to teaching he was an instructor pilot in F104, B57, T33, and H13 planes. Here's where I regret the time lag between receipt of his letter and publication of these notes. If his prediction, "will probably be in Vietnam within a year," came true, he's there now. Major Kutyna had news of others in his class. After a year as director of safety at S.S.D. in Los Angeles, Lieutenant Colonel **Carl Cathey** was at George A.F.B. training in FAC's for a tour in Vietnam. Recent word has him just arriving in Thailand for duty with the famed Eight Tactical Fighter Wing. Lieutenant Colonel **Donald Casey** was second in command of Wright Test Operations at Wright Patterson A.F.B. in Ohio. He is now also with the Eighth Tactical Fighter Wing. Captain **Robert C. Limburg** was working for S.A.C. at S.S.D. in Los Angeles. . . . At the Naval Air Systems Command in Washington, D.C., was Captain **Jack J. Hinman, III**, '46. He was Inspector General and Director of Administration, a job he came to after a year of instruction at the National War College in Washington. Also in the nation's capital was Commander **Carl J. Ostertag**, '56, Assistant for Fire Control and Guidance (SP2301) in the Navy's Special Projects Office. With his wife Joyce and six children, he was then living in McLean, Va. If things went as planned there is now a (retired) after his name. Twenty years came up last October. . . . So much for now. We'll do some more catching up next month, but do keep me up to date.—Professor **Walter Wrigley**, Correspondent, Room IL3-419, M.I.T., Cambridge, Mass 02139

Sloan

Thornton A. Wilson '53, has recently been elected President of the Boeing Company. He was formerly Executive Vice President. This summer, James R. Killian, Jr., '26, announced Mr. Wilson's election to the governing body of M.I.T. as a Member of the Corporation. He will serve for five years as a term member. . . . **Eugene A. Caffero's** ('60), involvement in Latin America has deepened. Newly named Vice President of the Chrysler Corporation he will direct all Chrysler operations, in Latin America, including subsidiary and affiliated companies.

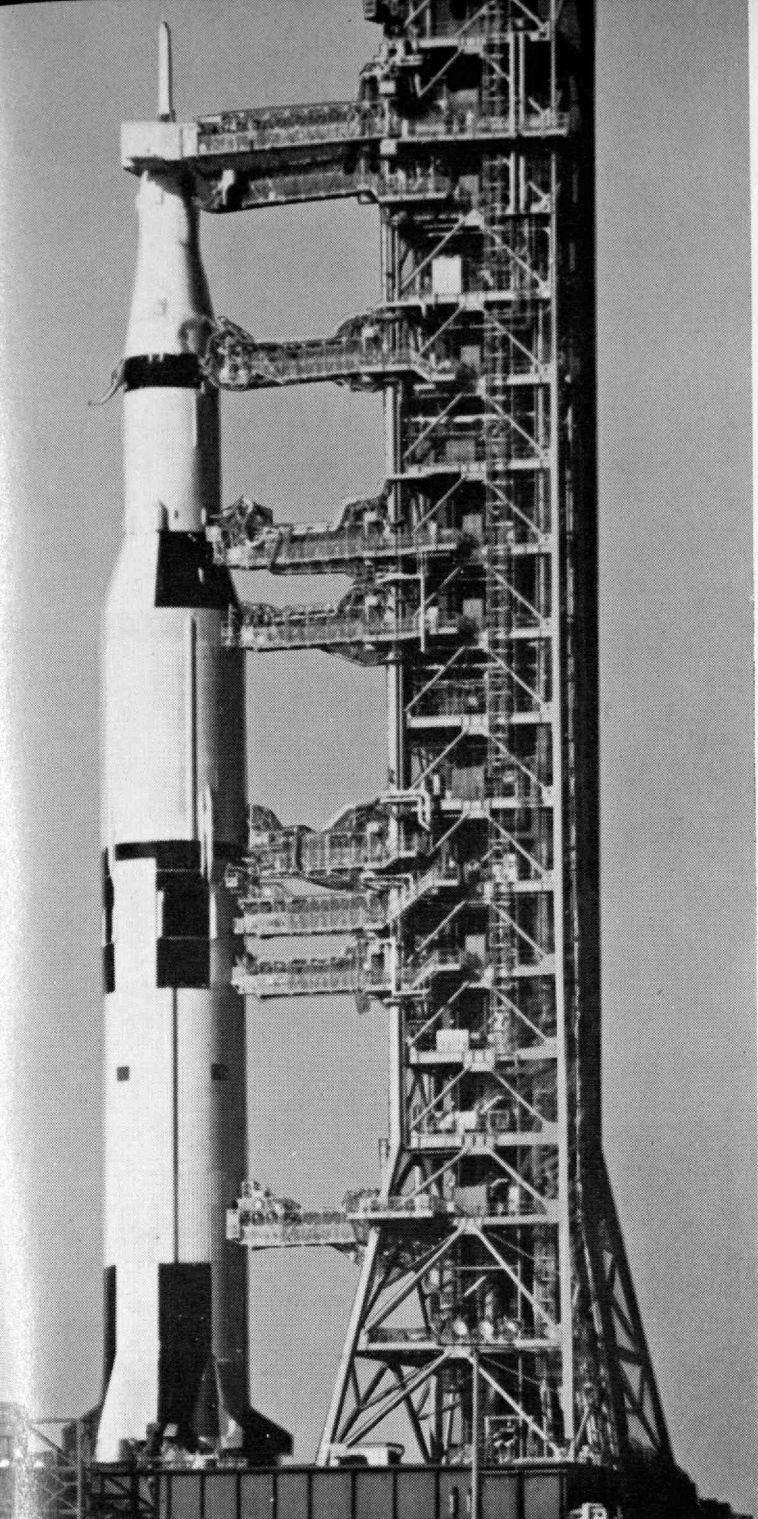
Arnold D. Carlson, 66, with Avco Corporation since 1955, has been appointed Vice President of Administration and Planning at Avco Space Systems Division.

A letter from **John P. Eberhard**, '59, offers the following comments and news: "My convictions are so strong, and my judgment of how we should be proceeding were so thwarted by the policies of the National Bureau of Standards, that I resigned on May 1, 1968. This summer I begin a new assignment as the Dean of a new school of technology and design at the University of New York at Buffalo. I have an opportunity to bring into existence a new kind of school. Part of my concern will be how the next generation of designers utilizes and develops a new concept of standards." . . . Ever wonder who is responsible for those swing-away steering wheels and the dual action station wagon door-gates? It is **Stuart M. Frey**, '61. His newest assignment—overall supervisor for engineering Ford's North American car and truck bodies. . . . Peter P. Gil, Associate Dean for Executive Programs at M.I.T., informs us that **Malcolm C. Geffen**, who is a Sloan Fellow this year from South Africa General Electric, has just been nominated Marketing Man of the Year in South Africa by the Advertising Press and Radio Review—the official marketing organization of the country. Mr. Geffen is the youngest man to have been selected for this honor.



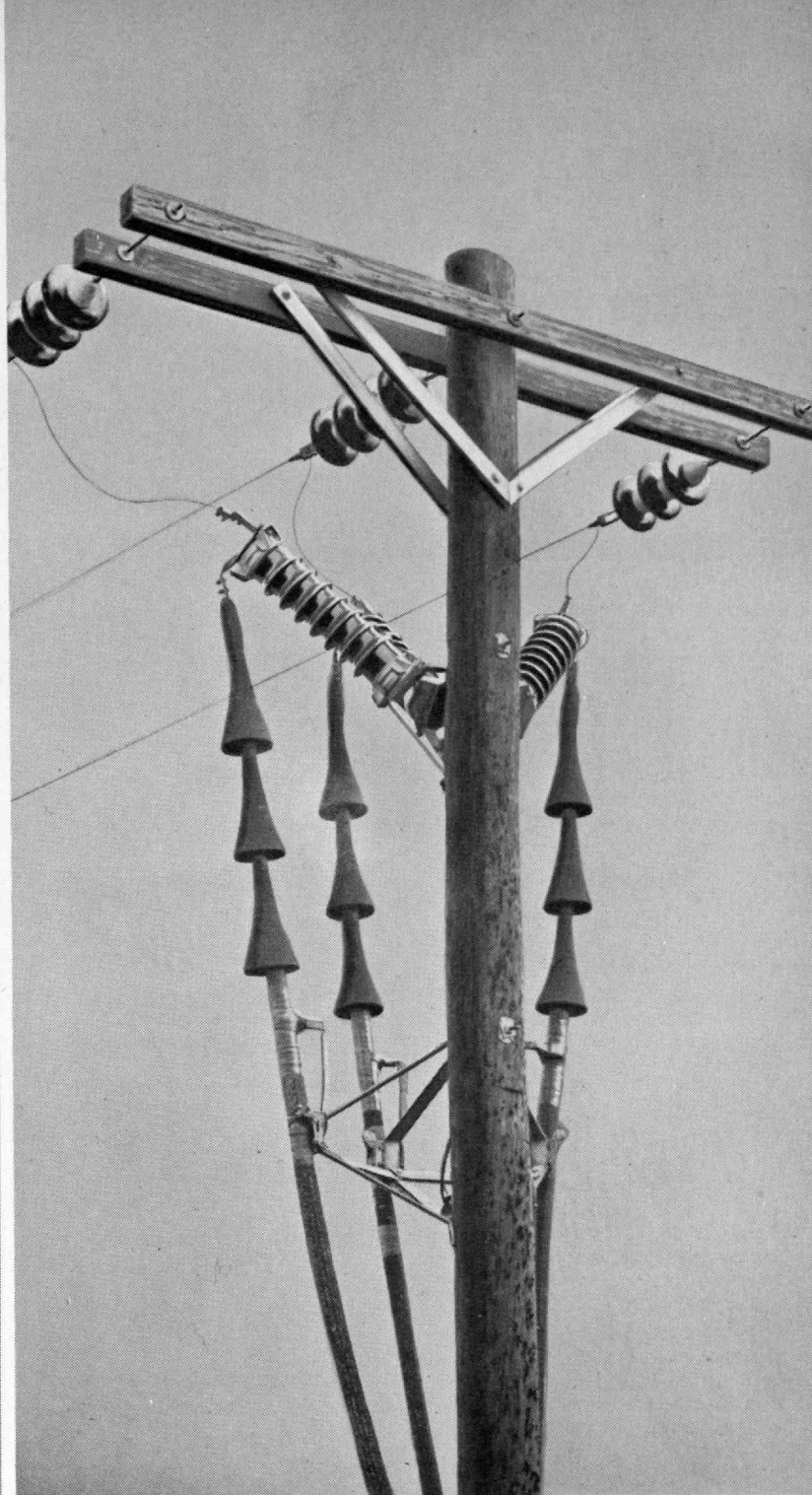
Richard J. Howe, '65, is now Assistant East Texas Division Manager for Humble Oil & Refining Company.

New appointments: **William V. Gudaitis**, '66, has been named Acting Deputy Project Manager of the Hawk Project Office at the Army Missile Command, where he has served since 1960. . . . **John C. Leslie**, '32, is now Vice President-International Affairs with Pan American World Airways. . . . Rosewall Industries, Pittsburgh-based parent company of Plasteel Products Corporation of Washington, Pa., announced the appointment of **James I. Spiegel**, '64, as President of Plasteel. . . . **Joseph F. Rocky**, '61, has been named Director of Marketing for the Plastic Products and Coatings Intermediates Divisions of Union Carbide Corporation. . . . The Ternstedt (Warren) Division of General Motors Corporation has a new General Sales Manager **Harold E. Stahl**, '61. . . . Texas Instruments Inc., has appointed **John F. Wilson**, '41, Vice President—Northeastern U.S. His headquarters will be in Attleboro, Mass.



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cables (1 required for each synthesizer decade) are \$75 each.

High-Stability Oscillators Other accessories enable you to lock the synthesizer's internal crystal oscillator for improved long-term stability. The 1160-P3 Standard-Frequency Oscillator sells for \$525, and it reduces drift to 3×10^{-9} per day after warmup. For even greater stability, the 1115-C Standard-Frequency Oscillator (\$1800) further improves deviation to 5×10^{-10} per day.

Of course, you don't have to buy *any* of these accessories when you order a GR synthesizer, but because they're available as standard items, they make the most versatile synthesizers on the market even more versatile.

For complete information or a demonstration, call your nearest GR office or write General Radio Company, West Concord, Massachusetts 01781; telephone (617) 369-4400. In Europe Postfach 124, Ch 8034, Zurich 34, Switzerland.

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